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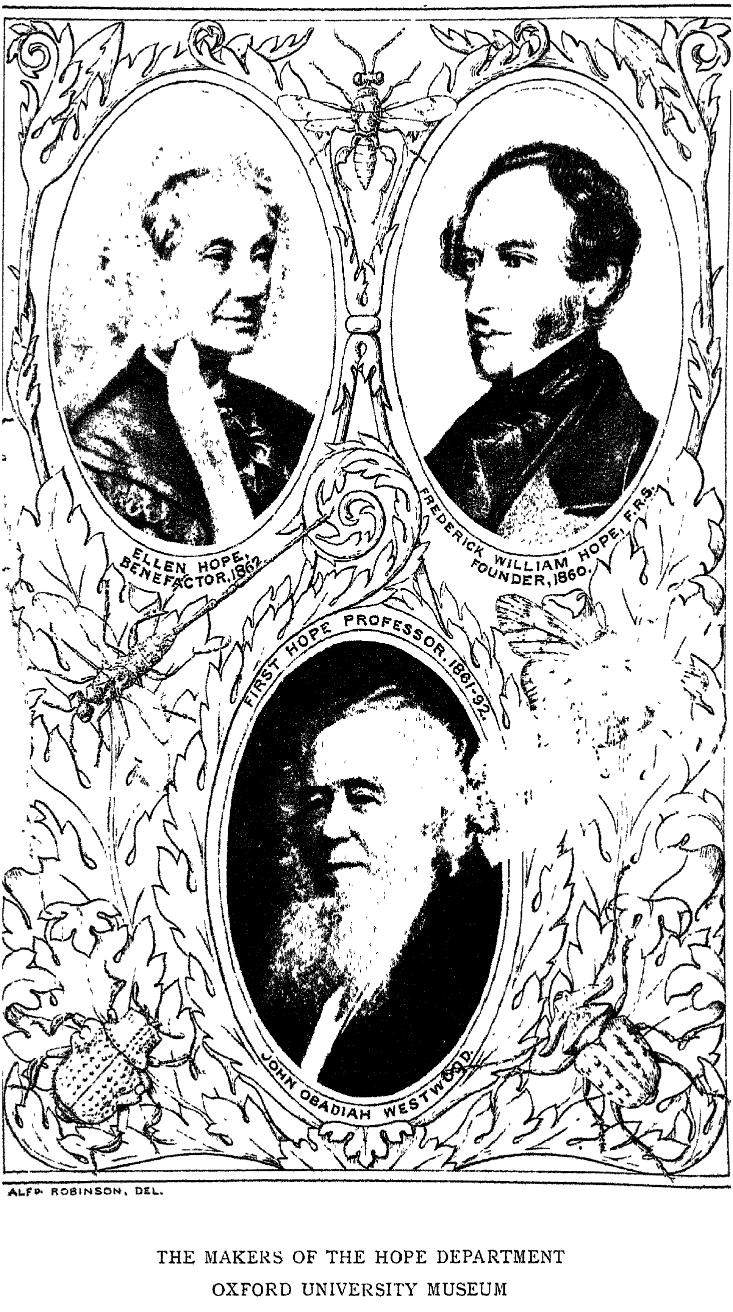
ELLEN HOPE,
BENEFACTOR, 1862
FREDERICK WILLIAM HOPE, F.R.S.
FOUNDER, 1860.
FIRST HOPE PROFESSOR. 1861-92.
JOHN OBADIAH WESTWOOD.
ALFD. ROBINSON, DEL.

THE MAKERS OF THE HOPE DEPARTMENT

OXFORD UNIVERSITY MUSEUM

THE HOPE REPORTS

VOL. X

1913—1922

WITH A SEPARATE APPENDIX

EDITED BY

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THE AMERICAN ENTOMOLOGICAL SOCIETY

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PREFACE.

THE preceding three volumes of Hope Reports, VIII, VIII Appendix, and IX, were issued together in July, 1913. A year later, before the accumulation of sufficient separata to make up a new volume, the war came, and with it interruption and a lessened output of work. Researches nevertheless proceeded and were even in some respects favoured by the war. Thus three of the naturalists who have done most for the Hope Department, Capt. G. D. H. Carpenter, Capt. W. A. Lamborn, and the Rev. Canon St. Aubyn Rogers entered ex-German East Africa and have greatly increased our knowledge of the insect fauna, at the same time adding extensively to the University Collections. When, owing to these and other kind helpers of the Department, at home and abroad, one or more volumes might have been issued, increased cost of production and lessened available funds stood in the way, so that when finally the situation was reviewed during the past Christmas Vacation it was found that the separata of nearly 150 papers had accumulated, counting the numerous extracts from the Proceedings of the Entomological Society of London as one for each year from 1913 to 1921. Many of these papers were long, important and extensively illustrated memoirs, and, unless the books were to be inconveniently bulky, as some of the earlier ones undoubtedly are, it was estimated that the whole series could not be compressed into less than five volumes.

Valuable publications are received by the Department in exchange for the Hope Reports, and, the costs having somewhat diminished, it was felt that the arrears must be cleared off and the volumes issued. The delay has been in some respects advantageous, for it rendered possible a convenient grouping of the separata in some of the volumes, viz., XI, XII and XIII, a grouping fully explained in the prefaces and summarised on title-pages and covers.

Several of the papers or notes in these five books are associated with the names of dear friends who are no longer with us. The debt which the University and the Hope Department owe to them will be spoken of in the prefaces or the papers included in the volumes.

The present volume, X, and its Appendix resemble the majority of the earlier Reports in the varied nature of their contents, so varied indeed that no brief indication of them can be given. The Appendix contains thirty-three memoirs of royal octavo or such other size as would have involved serious injury if the attempt had been made to include them in the regular series. Some account of their varied contents will be found in an introductory note to the volume.

Volume X contains fifty-one papers published in the years 1913—1922. Memoirs 2 to 13 deal with Ethiopian Lepidoptera. No 2, by the late Dr. G. B. Longstaff, D.M., F.R.C.P., a most generous friend to the Department, describes the earlier collections made by Capt. (now Col.) R. S. Wilson in the Southern Kordofan, an interesting and little-known locality. No. 3, by Dr. H. Eltringham, D.Sc., describes Capt. W. A. Lamborn's captures in ex-German East Africa. No. 4, by the late Roland Trimen, Hon. M.A., F.R.S., another friend to whom the Department owes much kind help, Nos. 5 to 9, by Dr. H. Eltringham, and Nos. 10 and 11, by Dr. F. A. Dixey, D.M., F.R.S., contain descriptions of new species and sub-species, and revisions of genera and smaller groups. They deal with the Satyrine (No. 4), Nymphaline (5, 6), Acraeine (7, 8), Lycaenid (9), and Pierine (10, 11) butterflies,—all Ethiopian except No. 11, which also includes *Pierinae* from other parts of the world. Included in the above series are revisions by Dr. Eltringham of two very difficult groups—*Larinopoda* (9) and the African species of *Neptis* (6).

Nos. 12 and 13 are concerned with Ethiopian moths. The first, by the Professor, on a large collection made by W. Feather, F.E.S., in Somaliland, includes descriptions of 10 new genera, 109 species, and 2 sub-species, by Sir G. F. Hampson, Bart., L. B. Prout, J. H. Durrant and Dr. Karl Jordan. No. 13 contains descriptions of new species by G. T. Bethune-Baker, F.L.S.

Coleoptera form the subject of the next four papers, No. 14 containing notes by M. H. Boileau on the *Lucanidae* (Stag-beetles) of the British Museum and Hope Department, Nos 15 and 16, by G. C. Champion, F.Z.S., on beetles recorded or described by the Rev. F. W. Hope. No. 17, by the same distinguished authority, describes *Anthicidae* from the islands of Mysol and Waigiou, the Oxford material including specimens from the historic collection made by Alfred Russel Wallace.

Three papers deal with Hymenoptera. In No. 18, the collection of Australian ants, made by the Professor in 1914, is described by W. C. Crawley, F.E.S., with notes on habits, etc., by the captor. No. 19, by the Rev. F. D. Morice, M.A., F.E.S., includes the description of a new Chrysid taken by Dr. Longstaff at Khartum in 1909, while Dr. R. C. L. Perkins, D.Sc., F.R.S., in No. 20 discusses the relation of Westwood's genus *Trichogramma* to one described much later by Riley, and concludes that they are the same.

The Neuroptera are represented by a single paper, No. 21, in which Father Longinos Navas, S.J., describes several new species in the Hope Collection.

British insects form the subject of the next five papers,—No. 22 on the butterflies, Nos. 25 and 26 on the Coleoptera of the Oxford District, by Commander J. J. Walker, Hon. M.A., R.N.; Nos. 23A to 23E, a series of notes by F. C. Woodforde, B.A., Exeter College, on the Hope Collection of British Macro-Lepidoptera, which owes so very much to his kind help for many years; No. 24, containing interesting notes on the time of appearance and food-plants of the Trypetid flies of the Oxford District, by A. H. Hamm, F.E.S., of the Hope Department.

The remaining papers, except the last, No. 52, are the direct or indirect result of the fine work done by R. S. Bagnall, F.L.S., F.E.S., during his brief residence in Oxford as Librarian and Assistant Curator of the Hope Department, work which had to be abandoned for other responsibilities arising out of the war.

Papers 27 to 40 all deal with the Thysanoptera (*Thrips*), a group which the author has made his own. Nos. 27 to 35 form a series containing brief descriptions of new species; 33 and 34, published in 1916, being included because they are a continuation of the others. Nos. 36 to 39 contain descriptions of new British species of the same group, No. 40 an account of a Tertiary Thysanopteron from amber. No. 41 deals with a Chalcid parasite of *Thrips*.

No. 42 discusses the systematic position of the Protura, a very primitive group of insects. No. 43, with a coloured plate, refers to British Protura and Thysanoptera, but also includes sections on a British Hymenopteron and British Diptera by F. W. L. Sladen, F.E.S., and J. E. Collin, F.E.S. In No. 44 Bagnall reviews the field work of 1911 in Protura, Thysanoptera and other groups.

In Nos. 45 and 46, two Centipedes *(Lithobius)* new to Britain are described, in 47 the Scottish Symphyla (*Scolopendrella*, etc.).

The series of Bagnall's publications in this volume closes with Nos. 48 to 51, a valuable set of four consecutive papers on the Arthropoda of the area studied by the Vale of Derwent Naturalists' Field Club, and published in its Transactions,—the Woodlice (Terrestrial Isopod Crustacea) in 48, the Myriapods (Centipedes, Millipedes, etc.) in 49, the Spiders, Harvestmen and Pseudo-scorpions in 50, and the *Oribatidae* (Beetle-mites) in 51. W. L. Turner co-operated with Bagnall in writing 50. The Rev. J. E. Hull, M.A., is the author of 51, but, inasmuch as the four papers form a connected series, it is included in the present volume.

No. 52, the Report of the Hope Professor for 1913—1914, gives a detailed account of the work of the Department during the year-and-a-half before the war and in its earliest months. The absence of later Reports up to the present date will be understood by those who read the first two paragraphs, although it must in justice be added that the immense increase in the cost of printing would, under any circumstances, have necessitated a great reduction in length. It is hoped that a Report for 1922 and later years will appear in due course.

EDWARD B. POULTON.

HOPE DEPARTMENT OF ZOOLOGY,
UNIVERSITY MUSEUM, OXFORD.
February 12, 1923.

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Full references to the original channels of publication, omitted from some of the separata, are given in the following list. Whenever the vicious habit of re-paging has been followed by the printers, the original number has been added in M.S. to the first page of the separatum.

1. Preface.

2. Butterflies of Southern Kordofan, collected by Captain R. S. Wilson, Lancashire Regiment, with map, by Dr. G. B. Longstaff, M.A., D.M., F.R.C.P., New College, Oxford. (From "Transactions of the Entomological Society of London," 1916, p. 269.)

3. On a Collection of Butterflies taken in East Africa by Mr. W. A. Lamborn, by Dr. H. Eltringham, M.A., D.Sc., New College, Oxford. With Notes on the Pierinae by Dr. F. A. Dixey, F.R.S. and Description of a New Form of P. dardanus, female, by Prof. E. B. Poulton, F.R.S. (*Ibid.*, 1917, p. 322.)

4. Description of a New Species of Pseudonympha (Satyrinae) from South Africa, with Plate XII., by Roland Trimen, M.A., F.R.S. (From "Entomologist's Monthly Magazine," 2nd Ser., Vol. XXV., December 1914, p. 281.)

5. Four New African Species of Neptis, by Dr. H. Eltringham. (*Ibid.*, 3rd Ser., Vol. VII., February 1921, p. 26.)

6. On the African Species of the Genus Neptis, Fab., with Plates XX.—XXV. and one Text-fig., by Dr. H. Eltringham. (From "Transactions of the Entomological Society of London," 1921, p. 532.)

7. On New or Little-known Forms of Acraea, by Dr.. H. Eltringham. (*Ibid.*, 1913, p. 407.)

8. On Certain Forms of the Genus Acraea. A Reply to M. Ch. Oberthür, with Plate LXXIV., by Dr. H. Eltringham. (*Ibid.*, 1916, p. 289.)

9. On the Species of the Genus Larinopoda, Butler, with Plates X.—XI. and one Text-fig., by Dr. H. Eltringham. (*Ibid.*, 1922, p. 254.)

10. The charina Group of Pinacopteryx, with Text-figs. 1—20, by Dr. F. A. Dixey, M.A., D.M., F.R.S., Subwarden of Wadham College, Oxford. (*Ibid.*, 1918, p. 191.)

11. New Species and Subspecies of Pierinae, with Plates I.—II. and Text-figs. 1—7, by Dr. F. A. Dixey. (*Ibid.*, 1915, p. 1.)

12. On a Collection of Moths made in Somaliland by Mr. W. Feather, by Professor E. B. Poulton, M.A., D.Sc., F.R.S. Descriptions of New Species, with Plates I.—II., by Sir G. F. Hampson, Bart., L. B. Prout, J. H. Durrant, and Dr. Karl Jordan. (From "Proceedings of the Zoological Society of London," 1916, p. 91.)

13. Descriptions of New Species of African Heterocera in the Oxford Museum, by G. T. Bethune-Baker, F.L.S., F.Z.S. (From "Annals and Magazine of Natural History," Ser. 8, Vol. XII., July 1913, p. 62.)

14. Note sur Lucanides conservés dans les Collections de l'Université d'Oxford et du British Museum, par M. H. Boileau, F.E.S. With Plate IX. (From "Transactions of the Entomological Society of London," 1913, p. 213.)

15. Notes on the Coleoptera recorded from "Resin animé," by the Rev. F. W. Hope, by G. C. Champion, F.Z.S., F.E.S. (From "Entomologist's Monthly Magazine," 3rd Ser., Vol. III., January 1917, p. 7.)

16. The Geographical Distribution and Synonymy of the Dasytid Beetle Acanthocnemus nigricans, Hope (= ciliatus, Perris), with Text-fig., by G. C. Champion. (*Ibid.*, 3rd Ser., Vol. VIII., April 1922, p. 77.)

17. A New Genus of Anthicidae (Coleoptera) from the Islands of Mysol and Waigiou, by G. C. Champion. (From "Annals and Magazine of Natural History," Ser. 8, Vol. XVII., May 1916, p. 395.)

18. Notes on Some Australian Ants. Biological Notes by the Professor, and Notes and Descriptions of New Forms, with Text-figs 1, 2, by W. C. Crawley, B.A., F.E.S., F.R.M.S. (From "Entomologist's Monthly Magazine," 3rd Ser., Vol. VIII., May 1922, p. 118, June 1922, p. 121.)

19. New Chrysids from Egypt and Algeria, by the Rev. F. D. Morice, M.A., F.E.S. (From "Transactions of the Entomological Society of London," 1916, p. 264.)

20. On the Hymenopterous Genera Trichogramma, Westw., and Pentarthron, Riley, with Plate XXXIII., by Dr. R. C. L. Perkins, M.A., D.Sc., F.E.S. (From "Transactions of the Entomological Society of London ," 1913, p. 603.)

21. Algunos Neurópteros del Museo de Oxford, por el R. P. Longinos Navás, S.J. Text-figs. 1, 2. (From "Boletin de la Sociedad Aragonesa de Ciencias Naturales," March 1914, p. 61.)

22. The Butterflies of the Oxford District, by Commander James J. Walker, M.A., R.N., F.L.S. (From "Entomologist's Monthly Magazine," 3rd Ser., Vol. IV., November 1918, p. 246.)

23A—23E Some Notes on the Collection of British Macro-Lepidoptera in the Hope Department of the Oxford University Museum, by F. C. Woodforde, B.A., F.E.S., Exeter College, Oxford. (From "Entomologist," Vol. LIII., 1920—July, p. 152, August, p. 173, September, p. 199, November, p. 257.
Vol. LIV., 1921—January, p. 8, April, p. 90, June, p. 140, July, p. 161, December, p. 285;
Vol. LV., 1922—January, p. 12.)

24. Trypetidae from the Oxford District, with Notes on their Time of Appearance and Food-plants, by A. H. Hamm, F.E.S. (From "Entomologist's Monthly Magazine," 3rd Ser., Vol IV., April, 1918, p. 87.)

25. Fourth Supplement to the Preliminary List of Coleoptera of the Oxford District published in the Report of the Ashmolean Natural History Society of Oxfordshire for 1906, by Commander J. J. Walker. (From Report of the above Society for 1914, p. 62.)

26. Fifth Supplement to the above Preliminary List, by Commander J. J. Walker. (From Report of the above Society, for 1920, p. 23.)

27. Brief Descriptions of New Thysanoptera.—I., by Richard S. Bagnall, F.L.S., F.E.S. (From "Annals and Magazine of Natural History," Ser. 8, Vol. XII., September 1913, p. 290.)

28. Brief Descriptions of New Thysanoptera.—II., with Text-fig., by R. S. Bagnall. (*Ibid.*, Vol. XIII., January 1914, p. 22.)

29. Brief Descriptions of New Thysanoptera.—III., with Text-figs. 1—3, by R. S. Bagnall. (*Ibid.*, Vol. XIII., March 1914, p. 287.)

30. Brief Descriptions of New Thysanoptera.—IV., by R. S. Bagnall. (*Ibid.*, Vol. XIV., November 1914, p. 375.)

31. Brief Descriptions of New Thysanoptera.—V., with Text-figs. 1, 2, by R. S. Bagnall. (*Ibid.*, Vol. XV., March 1915, p. 315.)

32. Brief Descriptions of New Thysanoptera.—VI., with Text-figs. 1, 2, by R. S. Bagnall. (*Ibid.*, Vol. XV., June 1915, p. 588.)

33. Brief Descriptions of New Thysanoptera.—VII., by R. S. Bagnall. (*Ibid.*, Vol. XVII., March 1916, p. 213.)

34. Brief Descriptions of New Thysanoptera.—VIII., with Text-figs. 1—3, by R. S. Bagnall. (*Ibid.*, Vol. XVII., May 1916, p. 397.)

35. On a New Species of Melanothrips (Thysanoptera) from Tunisia, by R. S. Bagnall. (From "Entomologist's Monthly Magazine," 2nd Ser., Vol. XXIV., November 1913, p. 263.)

36. On two Species of Haplothrips new to the British Fauna, by R. S. Bagnall. (*Ibid.*, 2nd Ser., Vol. XXIV., October 1913, p. 227.)

37. Descriptions of Some New Species of British Thysanoptera (Tubulifera), by R. S. Bagnall. (*Ibid.*, 2nd Ser., Vol. XXIV., November 1913, p. 264.)

38. Descriptions of Some New Species of British Thysanoptera (Tubulifera), with Notes on various Described Forms, by R. S. Bagnall. (*Ibid.*, 2nd Ser., Vol. XXV., January 1914, p. 35.)

39. Euthrips tamicola, a New Species of Thysanoptera from the Flowers of the Black Bryony, by R. S. Bagnall. (*Ibid.*, 2nd Ser., Vol. XXV., November 1914, p. 273.)

40. Fossil Insect in Amber. On Stenurothrips succineus, gen. et. sp. nov., an interesting Tertiary Thysanopteron, with plate XXXVI., by R. S. Bagnall. (From "Geological Magazine," Decade VI., Vol. I., No. 605, November 1914, p. 483.)

41. A Chalcid Parasitic on Thrips (Thysanoptera), by R. S. Bagnall. (From "Report, British Association," Birmingham, 1913, p. 531.)

42. On the Systematic Position of the Order Protura, by R. S. Bagnall. (*Ibid.*, Birmingham, 1913, p. 531.)

43. Some Interesting British Insects (V.) [Hymenoptera, Thysanoptera, Protura, Diptera], with Plate II., by F. W. L. Sladen, F.E.S., R.S. Bagnall, F.L.S., and J. E. Collin, F.E.S. (From "Entomologist's Monthly Magazine," 2nd Ser., Vol. XXIV., August 1913, p. 171.)

44. Review of Field Work in 1911 [Myriopoda, Ectoparasites, Protura, Apterygota, Thysanoptera], by R. S. Bagnall. (From "Entomologist's Record," Vol. XXV., No. 9, 1913, p. 224.)

45. Lithobius duboscqui, Brölemann, a Centipede new to the British Fauna, by R. S. Bagnall. (From "Zoologist," August 1913, p. 292.)

46. Lithobius lapidicola, Meinert, a Centipede new to the British Fauna, by R. S. Bagnall. (*Ibid.*, March 1914, p. 102.)

47. The Scottish Symphyla, by R. S. Bagnall. (From "Scottish Naturalist," August 1913, p. 182.)

48. The Woodlice (Terrestrial Isopoda) of Northumberland and Durham, with Keys to the Genera and Species (Text-Figs. 1—14), by R. S. Bagnall. (From "Vale of Derwent Naturalists' Field Club: Transactions, n. Ser., Vol. I., pt. 2, 1913 (publ. 1914), p. 94.)

49. The Myriapods of the Derwent Valley, by R. S. Bagnall. (*Ibid.*, p. 116.)

50. Preliminary List of Spiders, Harvestmen and Pseudo-scorpions found in the Derwent Valley, by R. S. Bagnall and W. L. Turner. (*Ibid.*, p. 129.)

51. Oribatidae (Beetle-mites) of the County of Durham, with Special Reference to the Derwent Valley, by the Rev. J. E. Hull, M.A. (*Ibid.*, p. 152.)

52. Report of the Hope Professor of Zoology for 1913-14.

X. *Butterflies of Southern Kordofan, collected by Captain R. S. Wilson, Lancashire Regiment.* By G. B. LONGSTAFF, M.A., M.D., F.L.S.

[Read May 3rd, 1916.]

WITH MAP.

A VALUABLE addition has been made recently to the Hope Collection at Oxford in the shape of a number of butterflies from the Nubâ Hills in Southern Kordofan, presented by Mr. C. A. Willis, late an Inspector in the Civil Service of the Anglo-Egyptian Sûdân, but now Assistant Director of Intelligence at Khartûm.

The butterflies were collected by Captain R. S. Wilson, of the Lancashire Regiment, more than ten years ago, in November and December 1904, but owing to various circumstances they were not examined until recently.

The collection comprises 223 specimens belonging to 62 species of butterflies, and one moth, all from the hilly country lying between El Obeid on the north and Lake Nô on the south, and between Darfur on the west and the White Nile on the east, and is especially interesting since little or nothing has been published concerning the butterfly fauna of that remote part of the world.

To speak more precisely, the area to be dealt with lies between Lat. 12° 40′ N. and Lat. 10° 40′ N.—a distance of about 120 miles, and between Long. 29° 40′ E. and 30° 31′ E.—about 90 miles.

Although none of Captain Wilson's collecting ground is nearer to the White Nile than 90 miles, it all lies within the basin of that river, and it was for that reason that I was asked by some of my Oxford friends to write a memoir setting forth the geographical relationship between the insects in Captain White's collection and those previously dealt with by me in a paper entitled "The Butterflies of the White Nile: A study in Geographical Distribution."[*]

Naturally, my first desire was to get into communication with the collector, but war conditions made this impos-

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[*] Trans. Ent. Soc. Lond., 1913, pp. 11–56.

It should be noted that the specimens bear particulars as to the localities and exact dates of capture; but at present I have no information as to the circumstances under which they were taken, or the plants with which they were associated.

The first thing that struck me on looking at the collection was that it bore internal evidence of being a fair sample of the fauna,* inasmuch as, among others, such a comparatively obscure insect as *Pinacopteryx venata* was represented by a series of nine specimens, as compared with four *Danaida chrysippus*, one *Teracolus protomedia* and one *Terias brigitta*. On the other hand, that the collector had not confined his attentions to the more sluggish insects was proved by the presence of six *Eronia leda*.

The collection had been previously critically examined by my friends, Dr. F. A. Dixey—*Pierinae*, Dr. H. Eltringham—*Nymphalidae*, and Mr. G. T. Bethune-Baker—*Lycaenidae* and *Hesperiidae*, who all very kindly placed their notes at my disposal.

In order to make the comparison of the two papers as easy as possible, I have dealt with the insects in the same order as in the paper referred to. Each species has a serial number, the same in the two papers; where a species occurs in this paper not dealt with in the first, letters are added to the last numeral, 7*a*, 7*b*, etc., the interpolated species being put in what seemed to be suitable places.

The very numerous quotations from these three authorities, as well as those from Mr. Willis's letters are within inverted commas. The old plate of the map in the earlier paper has been used again with a few additions.

Family NYMPHALIDAE.

Sub-family *DANAINAE*.

1. **Danaida chrysippus**, Linn.

α. Curiously enough, the typical form is not represented in the collection.

β. Form *alcippus*, Cram.

One ♂ from Jebel Tira Mandi, Nov. 25, 1904.

"The hind-wing upperside nearly all white, with the usual exception of the black border inwardly tinged with yellow" (Eltringham).

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* At least so far as the butterflies to be met with in November and December 1904.

γ. Form *dorippus*, Klug.

One ♂ and one ♀ from J. Tira Mandi, Nov. 25, 1904.

δ. Form *albinus*, Lanz.

One ♂, Kadugli, Dec. 13, 1904.

"The white covers a large area of the hind-wings. There is the usual trace of the ancestral white bar in the subapical region of the fore-wings" (Eltringham).

2. **Tirumala petiverana,** Dbl. and Hew.

One ♀, Khor Nueila [Lat. 11° 21′ N.], May 26, 1906.

The locality is at least 2° further north than that given in the White Nile list.

Sub-family *SATYRINAE.*

3*a*. **Mycalesis milyas,** Hew.

Two ♀♀ of the dry-season form, Tira Mandi, Nov. 23, 1904.

Not in the White Nile list. Dr. Eltringham notes that the British Museum specimens are from Atbara (Abyssinia). Aurivillius [Seitz, "Gross-Schmetterlinge der Erde"] gives White Nile, and says it spreads to the Congo and Togo.

Sub-family *NYMPHALINAE.*

[4. It is remarkable that *Pyrameis cardui*, Linn., is not included in the collection.]

5. **Precis oenone cebrene,** Trimen.

One ♂, two ♀♀, Kadugli [Lat. 11° 0′ N.], Dec. 13, 1904.

6. **Precis clelia,** Cram.

One ♂, Tira Mandi [Lat. 10° 52′ N.], Nov. 25, 1904.

This is more than 1° further north than in the White Nile list.

"This species has recently suffered from the attention of the German entomologist Strand, who has given nine new names to trifling aberrations" (Eltringham).

7. **Precis orithyia madagascariensis,** Guen.

Three ♂♂ and two ♀♀, Dilling, Nov. 16, 1904; three ♂♂, Tira Mandi, Nov. 23, 25, 26, 1904; one ♂, Kadugli, Dec. 13, 1904.

Of this species Dr. Eltringham says: "The typical *orithyia* was first described from China, the sub-species *madagascariensis* (= *boopis*, Trimen) being the form inhabiting the African continent and Madagascar. The sub-species *here*, Lang, is found in Arabia, and is smaller, and without the red marks in fore-wing cell."

Dilling is nearly 2½° north of the Bahr al-Zarâfa, the previous White Nile record.

7*a*. **Precis octavia,** f. **sesamus,** Trimen.

One ♀, Jebel Shwai, Nov. 21, 1904; one ♂, Kadugli, Dec. 13, 1904, and one ♀ from the same locality, Jan. 18, 1905.

"The dry-season form of *P. octavia;* one ♀ may be regarded as tending slightly to an intermediate in that it shows rather more red, especially in the fore-wing cell" (Eltringham). Prof. Poulton tells me that this specimen much resembles the Abyssinian form, which is nearer to the western sub-species than to the southern form, which is found in British East Africa.

Although occurring in Abyssinia and Somaliland and widely distributed throughout South Africa, it is not in the White Nile list.

7*b*. **Catacroptera cloanthe cloanthe,** Cram.

One ♂, Khororak, Nov. 29, 1904; one ♂, one ♀, Kadugli, Dec. 13, 1904.

"One ♂ specimen tends towards the dry-season form named *obscurior* by Staudinger, in which the underside is darker" (Eltringham).

This species is not in the White Nile list, but has been found in Abyssinia and is widely distributed in Africa south of the Equator.

9. **Hamanumida daedalus,** Fabr.

One ♂ and one ♀, Dilling [Lat. 12° 3′ N.], Nov. 16, 1904; one ♀, Jebel Shwai [Lat. 10° 11′ N.], Nov. 21, 1904.

" The ♂ tends towards the form *meleagris*, Cram., being somewhat paler underneath " (Eltringham).

At least $2\frac{1}{2}°$ north of previous records.

10. **Neptis agatha,** Cram.

Five ♂♂ at Khororak [Lat. 10° 48′ N.], Nov. 29, 1904.

In my White Nile list, after mentioning that a *neptis* had been seen by me at Kîrô [Lat. 5° 22′ N.], I remark : " This species has been taken at Shoa, in Abyssinia [*circa* Lat. 10° N.]—perhaps the northern limit of the genus in East Africa."

11. **Byblia ilithyia ilithyia,** Drury.

One ♂, " of the wet-season form " (Eltringham), Kadugli, Dec. 23, 1904.

12. **Byblia acheloia acheloia,** Wall. (= *goetzius*, Herbst.).

One ♂, "of the dry-season form " (Eltringham), J. Tatcho [Lat. 10° 48′ N.], Nov. 28, 1904, *i. e.* at least 1° further north than in my White Nile list.

Sub-family *ACRAEINAE.*

14. **Acraea acerata acerata,** Hew.

" One ♂, more or less intermediate to the form *vinidia*, Hew." (Eltringham).

Tira Mandi, Nov. 25, 1904.

15. **Acraea terpsichore,** Linn.

Four ♂♂ and one ♀, all taken at Tira Mandi, Nov. 25, 1904. This is 5° 40′ north of the locality in the White Nile list.

" One ♂ is of the form *rougeti*, Guér., and the ♀ example resembles the ♂♂ more closely than is usual in this species " (Eltringham).

17. **Acraea encedon,** Linn.

" Ten ♂ examples, no two of which are exactly alike. Two nearest the typical form have the ground colour dull and somewhat darkly suffused. One resembles these, but has the fore-wing subapical white dusted with tawny.

The next two are intermediate between this and the *daira* form. The sixth is a nearly typical *daira*, Godm. and Salv., the seventh is of the form *lycia*, Wall., with some tawny suffusion, and the remainder are *lycia* of varying degrees of whiteness" (Eltringham).

All taken at Tira Mandi, Nov. 23, 25, 1904.

This series shows how much the species may vary in the same place and at the same time.

17*a*. **Acraea neobule,** Doubl.

One ♀, "unusually small" (Eltringham).

Taken at Kadugli, Dec. 29, 1904.

Not in the White Nile list. It occurs in Somaliland, Abyssinia and Socotra, and has a wide African distribution.

17*b*. **Acraea caecilia caecilia,** Fabr.

Two ♂♂ and two ♀♀, Kadugli, Dec. 17, 21, 23, 29, 1904.

All the specimens "have the characteristics of the western rather than the eastern form. Abyssinian examples may be of the western form or intermediate to *pudera*, Auriv., the eastern sub-species in which the apical black is narrow and sharply defined" (Eltringham).

A widely distributed species recorded from Nubia (Ambukôl), Abyssinia and Somaliland among other places, but not in the White Nile list.

[17*c*. **Acraea marnois,** Rogen.]

This is regarded by Aurivillius as a variety of *oncaea*, Hopff., but Dr. Eltringham ("African species of Acraea," pp. 184, 185) considers it more nearly allied to *caldarena* and *caecilia*. As the type (at Vienna) came from the Bahr el-Zarâfa it should be added to the White Nile list.]

17*d*. **Acraea doubledayi sykesi,** Sharpe.

A ♂, Kadugli [Lat. 11° 0′ N.], Dec. 17, 1904.

Not in the White Nile list. Dr. Eltringham says of it: "A single ♂ example of this rare species in exceptionally fine condition. This is the most northern record for the sub-species." The sub-species *A. doubledayi arabica*, Eltring., occurs in the Azvaki Ravine, S. Arabia.

Family LYCAENIDAE

I have to thank Mr. Bethune-Baker for determining the butterflies in this family.

19. **Polyommatus baeticus,** Linn.

One ♂, Dilling, Nov. 16, 1904.

20. **Lachnocnema bibulus,** Fabr.

One ♂, two ♀♀, Jebel Shwai, Nov. 21, 1904; two ♀♀, Tira Mandi, Nov. 23, 25, 1904.

The latter place is 2½° further south than any locality for the species given in the White Nile list.

21. **Tarucus theophrastus,** Fabr.

Two ♂♂, Jebel Shwai, Nov. 21, 1904; one ♀, Dilling, Nov. 14, 1904; one ♀ Tira Mandi, Nov. 25, 1904.

22. **Tarucus telicanus,** Lang.

One ♀, Khor Nubbaka, Nov. 12, 1904.

24*a*. **Castalius lactinatus,** Butl.

One, Tira Mandi, Nov. 23, 1904; one, Kadugli, Nov. 29, 1904.

Not in the White Nile list. For *C. cretosus*, Butl., of which Aurivillius considers this to be a variety, he gives Senegal and Abyssinia as localities, as well as the White Nile; for *C. lactinatus* he gives Somaliland only.

26. **Catochrysops malathana,** Boisd.

Four ♂♂, and two ♀♀, Tira Mandi, Nov. 23, 25, 1904; two ♂♂, Kadugli, Dec. 13, 17, 1904.

28. **Chilades trochilus,** Frey.

One, Jebal Shwai, Nov. 21, 1904.

30*a*. **Lycaenesthes crawshayi,** Butl., var. *minuta*, B.-B. var. nov.

A ♂, Dilling, Nov. 16, 1904; a ♀, Tira Mandi, Nov. 23, 1904.

Mr. Bethune-Baker has described this as a new variety of Butler's Nyassaland species.* It is but two-thirds of the size of specimens from Sierra Leone and Uganda, though Mr. Bethune-Baker has specimens intermediate in size from the Budonga Forest, in the Congo [4° 30′ S., 20° E.].

31. **Azanus sigillatus**, Butl. [?= *jesous*, Guér.].

One ♂, Tira Mandi [Lat. 10° 52′ N.], Nov. 23, 1904.

This is 5½° further north than in the White Nile list.

31*a*. **Azanus mirza**, Ploetz.

A ♂, Tira Mandi, Nov. 23, 1904.

Not in the White Nile list. The species has a wide distribution in Central and South Africa.

34. **Virachola antalus**, Hopff.

Two ♂♂, three ♀♀, all from Kadugli, Dec. 16, 17, 19, 1904.

This locality is 2½° further south than that given in the White Nile list.

34*a*. **Rapala licinia**, Mab.

One ♂, one ♀, Kadugli, Dec. 17, 23, 1904.

Not in the White Nile list. A South African species extending to Madagascar.

35*a*. **Axiocerces harpax**, Fabr.

Two ♂♂, eight ♀♀, Kadugli, Dec. 14, 16, 17, 29, 1904.

Not in the White Nile list. This is a South African species, recorded by Aurivillius from Waddelai, Lat. 3° N. Kadugli is in Lat. 11° N.

35*b*. **Spindasis kaduglii**, B.-B. sp. nov.

A ♂, Kadugli, Dec. 29, 1904.

Described by Mr. Bethune-Baker, who says that it is near to *S. victoriae*, Butl.†

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* See Ann. and Mag. Nat. Hist., 1916, p. 379.

† Ann. and Mag. Nat. Hist., 1916, p. 379.

35*c*. **Argiolaus ismenias**, Klug.

Two, Sungikai, Nov. 13, 1904; two, Kadugli, Dec. 16, 1904.

Not in the White Nile list. A fine but delicate species; the type came from Ambukôl, 6° to the north.

Mr. H. H. Druce has 6 ♂♂ and 1 ♀ from Lagos, of all places; they were captured by Mr. C. A. (later Sir Alfred) Moloney, then governor of the Colony. Mr. Druce writes me that he has since seen others from the same locality (Ann. and Mag. Nat. Hist. 1891, p. 148).

Prof. Poulton says that there are many resemblances between the fauna of Abyssinia and that of the West Coast.

35*d*. **Stugeta marmoreus**, Butl.

Two at Kadugli, Jan. 18, 1905.

Until lately represented solely by Petherick's type from "the White Nile," in the British Museum, but Mr. Bethune-Baker tells me that he has specimens from the Bahr el-Ghazâl to the south. See White Nile list, p. 55 footnote.

Family PAPILIONIDAE.

Sub-family *PIERINAE*.

Dr. Dixey has examined the butterflies of his favourite sub-family with the thoroughness characteristic of him, and has kindly placed his MS. notes at my disposal. All the determinations are his and the copious extracts from his notes are given in inverted commas.

"The Pierinae captured by Captain Wilson number twenty-one species. Of these all but two occur in the records brought together by Dr. G. B. Longstaff in his paper 'On the Butterflies of the White Nile.' The two not there recorded are *Glutophrissa epaphia*, Cram., and *Teracolus celimene*, Lucas. [See notes to these species, 39*a*, 51*a*.] . . . Of the nineteen species common to the two lists, fifteen were previously known to occur in latitudes corresponding to those explored by Capt. Wilson. . . . Eight of the fifteen occur also in Southern Arabia, and several of them have been recorded from the Nile Valley north of Khartûm. The four species included in Dr. Longstaff's list, but not previously known from localities so far north as Capt. Wilson's, are *Pinacropteryx venata*, *Teracolus achine*, *Eronia leda* and *Terias brigitta*. [See notes to these species under the serial numbers 40, 55, 63 and 67.] . . . It will be gathered that the predominant forms of Pierines in Capt. Wilson's collection are those characteristic of Arabia and North-east Africa. The chief exceptions to the general 'desert' aspect of the Pierine fauna are afforded by *Eronia leda* and *Glutophrissa epaphia*.

"The dry-season characters are strongly marked throughout the series, the chief exceptions occurring in two species of the genus *Teracolus* (*T. eupompe* and *T. evagore*). Of the former species, one specimen is 'wet' and six are 'dry.' Of the latter, two are 'wet' and four 'dry.'"

36. **Herpaenia eriphia**, Godt.

Two ♂♂, Kadugli, Dec. 14, 23, 1904.

"Both of the 'dry' northern form, = *lacteipennis*, Butl."

37. **Belenois gidica**, Godt.

A ♂, Tira Mandi, Nov. 25, 1904; a ♂, Tatcho, Nov. 28, 1904; three ♂♂, Kadugli, Dec. 13, 21, 1904.

"Dry season."

38. **Belenois severina**, Cram.

Four ♂♂, Kadugli, Dec. 27, 1904; one ♀, Sungikai, Nov. 13, 1904.

The latter locality is 1° 20′ north of the furthest range given in the White Nile list.

Dr. Dixey writes: "These are of what is usually considered the wet-season phase. The seasonal colouring resembles that shown by Mr. Marshall's Mashonaland specimens captured in March, and his bred Mashonaland specimens emerging in June after exposure to damp heat as both larvae and pupae. Two of the males are conspicuously marked on the underside with orange-yellow."

39. **Belenois mesentina**, Cram.

A ♂ from Khor Nubbaka, Nov. 12, 1904; two ♂♂, Kadugli, Dec. 23, 27, 1904.

39*a*. **Glutophrissa epaphia,** Cram.

Two ♀♀, Khororak, Nov. 29, 1904.

Not in the White Nile list. Dr. Dixey says: "This species, so far as I am aware, has not hitherto been met with in East Africa further north than Wadelai (about Lat. 2° N.), though Aurivillius gives 'ganz Afrika' as its habitat."

40. **Pinacopteryx venata,** Butl.

Two ♀♀, Sungikai [Lat. 12° 36′ N.], Nov. 13, 1904; one ♂, one ♀, Dilling, Nov. 14, 1904; one ♂, Tira Mandi, Nov. 23, 1904; one ♂, two ♀♀, Tatcho, Nov. 28, 1904; one ♂, Kadugli, Dec. 27, 1904.

Dr. Dixey says: "These differ in some respects from Dr. Longstaff's White Nile series, being generally 'drier.' Two at least of the females are hardly distinguishable (if at all) from dry-season females of *P. simana*, Hopff., and raise doubts as to whether Godart's *doxo*, the locality of which is unknown, may not after all be a female similar to these; in which case *doxo* would have priority as the name of the species."

Dr. Dixey's remarks in "The Butterflies of the White Nile," p. 31, should be compared with this later judgment.

Sungikai is upwards of 3° further north than any locality given for the species in that paper, and its occurrence there was, as Dr. Dixey says, somewhat unexpected.

47. **Teracolus amelia,** Lucas.

A ♂, Tatcho, Nov. 28, 1904; two ♂♂, Tatcho, Dec. 17, 21, 1904.

"Dry: the male taken in November is transitional towards the *catachrysops*, Butl., form of *T. vesta*, Reiche."

48. **Teracolus protomedia,** Klug.

Of this conspicuous species, which I found commonly on the White Nile, a single ♂ was taken at Dilling, Nov. 14, 1904.

49. **Teracolus halimede,** Klug.

Two ♂♂, one ♀, Kadugli, Dec. 14, 23, 1904.

Of these Dr. Dixey says: "Dry; like Dr. Longstaff's and Mr. Loat's from the White Nile."

51. **Teracolus eris,** Klug.

One ♂, Tira Mandi, Nov. 25, 1904; one ♂, two ♀♀, Kadugli, Dec. 14, 17, 21, 1904.

About 2° further south than my specimen captured in 1912. Dr. Dixey says: "Dry. The ♀♀ are 'drier' than any others in the Hope Collection, one of them very remarkably so. This specimen (Dec. 17) is also reduced in size."

51*a*. **Teracolus celimene,** Lucas.

One ♀, Khor Nubbaka [Lat. 12° 36′ N.], Nov. 12, 1904; a ♂, Tira Mandi [Lat. 10° 52′ N.], and another ♂, Kadugli [Lat. 11° 0′ N.], Dec. 14, 1904.

This conspicuous and distinct species is not in my White Nile list; Dr. Dixey says of it: "Has occurred in Abyssinia, and is found as far south as Swaziland and the Transvaal."

53. **Teracolus phlegyas,** Butl.

A ♂, Tatcho, Nov. 28, 1904; a ♂ and a ♀, Khhororak, Nov. 29, 1904; three ♂♂, Kadugli, Dec. 17, 21, 1904.

"Dry-season phase. The ♂♂ resemble one caught by Mr. W. S. L. Loat twelve miles north of Kâkâ, White Nile. (See Trans. Ent. Soc. London, 1903, p. 146.)"

54. **Teracolus eupompe,** Klug.

Three ♀♀, Sungikai, Nov. 13, 1904; one ♀, Dilling, Nov. 14, 1904; two ♂♂ and one ♀, Kadugli, Dec. 17, 21, 29, 1904.

"One ♀ is 'wet,' the others and the ♂♂ are 'dry.' All the specimens are small; one ♂ and one ♀ are dwarfs. The wet-season ♀ and the dwarf dry-season ♀ were taken on the same day, Nov. 13. [It may be added that both are alike in poor condition.—G. B. L.] They resemble White Nile specimens captured in February by Dr. Longstaff, but are generally somewhat smaller and 'drier' than Mr. Loat's specimens taken in January and March slightly further south."

55. **Teracolus achine,** Cram.

One ♀, Tira Mandi [Lat. 10° 52′ N.], Nov. 23, 1904.

"Dry-season. Resembles Dr. Longstaff's from the

White Nile, but is 'drier' than his series from Port Sûdân (Red Sea)." Tira Mandi is 1° 22′ north of any White Nile locality for this species, but 8° south of Suâkin, 8½° south of Port Sûdân.

57. **Teracolus daira,** Klug.

One ♀, Sungikai, Nov. 13, 1904; one ♂, four ♀♀, Kadugli, Dec. 14, 17, 21, 29, 1904.

"'Dry.' Resemble Dr. Longstaff's and Mr. Loat's from the White Nile; also Dr. Longstaff's from Khartûm."

58. **Teracolus evagore,** Klug.

Two ♂♂, Dilling, Nov. 14, 1904; one ♂, one ♀, Tira Mandi, Nov. 23, 25, 1904; two ♀♀, Kadugli, Dec. 29, 1904.

Dr. Dixey writes: "Two of the ♂♂ (Nov. 14) are wet-season; the remaining ♀ (Nov. 23) and the three ♀♀ are of the dry-season phase (*saxeus*, Swinhoe). The dry-season specimens resemble Dr. Longstaff's and Mr. Loat's White Nile series; the wet-season ♂♂ are like examples from further south and from Somaliland."

61. **Teracolus evarne,** Klug.

One ♂, Khororak, Nov. 29, 1904; one ♂, two ♀♀, Kadugli, Dec. 21, 1904.

"All dry-season. They resemble Dr. Longstaff's specimens from the White Nile (February 1912), but are generally smaller and 'drier' than the same collector's specimens from the west shore of the Red Sea (March 1912)."

62. **Eronia cleodora,** Hübn.

One ♀, Dilling, Nov. 14, 1904; five ♂♂, one ♀, Kadugli, Dec. 17, 21, 1904.

"These are of the North-east African form, and resemble Dr. Longstaff's and Mr. Loat's specimens."

63. **Eronia leda,** Boisd.

One ♀, Khor Nubbaka, Nov. 12, 1904; three ♂♂, Sungikai, Nov. 13, 1904; one ♂, Dilling, Nov. 14, 1904; one ♂, Tira Mandi, Nov. 23, 1904.

These places range from 2° 40′ to 4° 20′ north of the White

Nile records. Dr. Dixey notes that the ♀ is unusually pale; he also quotes my conjecture that "It would appear that this conspicuous insect does not get further down the White Nile than the Sadd."

65. **Catopsilia florella,** Fabr.

One ♂, one ♀, Sungikai, Nov. 13, 1904; two ♂♂, one ♀, Kadugli, Dec. 14, 16, 1904.

"Somewhat small. Resemble specimens from Khartûm captured in January and February 1912."

67. **Terias brigitta,** Cram.

One ♀, Sungikai, Nov. 13, 1904 [Lat. 12° 21′ N.].

On this species Dr. Dixey's note is: "Dry-season. Dr. Longstaff remarks (in his paper on the Butterflies of the White Nile, p. 48), 'It might appear allowable to conjecture that *brigitta* does not extend far north of Lake Nô, but the fact that specimens of . . . *T. senegalensis* . . . turned up no less than three degrees north of that place makes one cautious.' Capt. Wilson's specimen was caught in the Nuba Hills nearly 3° north of Lake Nô."

Sub-family *PAPILIONINAE.*

70. **Papilio pylades pylades,** Fabr.

Two, Jebel Shwai, Nov. 21, 1904; eight, Tira Mandi, Dec. 23, 25, 26.

"The western form" (Eltringham).

70*a*. **Papilio antheus nyassae,** Butl.

Three, Serraf Fellata [Lat. 11° 54′ N.], May 28, 1906.

"The East African form" (Eltringham).

Not in the White Nile list. The species has a wide Central African distribution.

Family HESPERIIDAE.

Mr. Bethune-Baker kindly determined these for me.

71*a*. **Sarangesa plistonicus,** Ploetz.

One, Dilling, Nov. 15, 1906; four, Tira Mandi, Nov. 23, 25, 26, 1904.

Not in the White Nile list.

71*b*. **Sarangesa pertusa,** Mab.

Three, Kadugli, Dec. 23, 1904.

Not in the White Nile list.

71*c*. **Caprona adelica,** Karsch, var. *Kordofani*, B.-B. var. nov.

One, Tira Mandi, Nov. 25, 1904.

Mr. Bethune-Baker says that this is the dry-country form, whereas *C. cassualalla*, B.-B., is the more variegated western form of the same insect found at Angola.*

I have taken *C. adelica* at Sydenham, Natal. It is not in the White Nile list.

72*a*. **Gegenes obumbrata,** Trimen.

One ♂ of the typical form, Tira Mandi, Nov. 25, 1904.

Not in the White Nile list.

72*b*. **Hesperia mafa,** Trimen.

One, Sungikai, Nov. 13, 1904; two, Kadugli, Dec. 13, 29, 1904.

Not in the White Nile list. This is a South African species.

How does the butterfly fauna of the Nuba Hills compare with the fauna of the White Nile hitherto known to us?

To begin with, material is sadly deficient for such a comparison, as is so often the case. For example, my White Nile list is founded for the most part on captures made in the month of February, whereas Capt. Wilson's insects were taken in November and December. Again, the time devoted to collecting at each place was a matter of days, more often of hours. These limitations should be kept in mind.

Although much of Northern Kordofan is more or less desert in character, both Mr. Willis and the Government Handbook speak of "forests" in the region of the Nuba Hills; it might therefore be reasonably expected that the fauna of the latter would exhibit a forest rather than a desert aspect.

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* See Ann. and Mag. Nat. Hist., 1916, p. 380.

The following lists show (A) the twenty species added to the fauna by Capt. Wilson, and (B) the thirty-five species in my White Nile list which he did not happen upon, or at any rate did not send home.*

A. SPECIES TAKEN BY CAPTAIN WILSON BUT NOT IN THE WHITE NILE LIST.

3*a*. *Mycalesis milyas*, Hew.
7*a*. *Precis octavia sesamus*, Trim.
7*b*. *Catacroptera cloanthe*, Cram.
17*a*. *Acraea neobule*, Dbl.
[*f. neobule arabica*, Rebel D]
17*b*. *Acraea caecilia*, Fab. D
17*c*. *Acraea doubledayi sykesi*, Sharpe
[*f. doubledayi arabica*, Eltring. D]

30*a*. *Lycaenesthes crawshayi*, Butl.
31*a*. *Azanus mirza*, Ploetz.
34*a*. *Rapala licinia*, Mab.
35*a*. *Axiocerces harpax*, Fab.
35*b*. *Spindaris kadugli*, B.-B.
35*c*. *Argiolaus ismenias*, Klug. D
39*a*. *Glutophrissa epaphia*, Cram.

51*a*. *Teracolus celimene*, Lucas

70*a*. *Papilio antheus nyassae*, Butl.
71*a*. *Sarangesa plistonicus*, Ploetz.
71*b*. *Sarangesa pertusa*, Mab.
71*c*. *Caprona adelica kordofani*, B.-B.
72*a*. *Gegenes obumbrata*, Trim.
72*b*. *Hesperia mafa*, Trim.

B. SPECIES IN THE WHITE NILE LIST BUT NOT IN CAPTAIN WILSON'S COLLECTION.

3. *Ypthima asterope*, Klug. D
4. *Pyrameis cardui*, Linn. D
8. *Hypolimnas misippus*, Linn. D ?
13. *Atella phalantha*, Drury.

16. *Acraea natalica*, Boisd.
18. *Acraea abdera*, Hew.
23. *Castalius usemia*, Neave.
24. *Cupido cretosus*, Butl.
25. *Catochrysops eleusis*, Dem. D
27. *Zizera lysimon*, Hub. D
29. *Lycaenesthes amarah*, Guér. D
30. *Lycaenesthes otacilia*, Trim.
32. *Azanus ubaldus*, Cram. D
33. *Deudorix livia*, Klug. D
35. *Hypolycaena philippus*, Fab.
41. *Calopieris eulimene*, Klug. D
42. *Teracolus calais*, Klug. D
43. *Teracolus phisadia*, Klug. D
44. *Teracolus castalis*, Stdgr. D
45. *Teracolus chrysonome*, Klug. D
46. *Teracolus vesta*, Reiche
50. *Teracolus pleione*, Klug D
52. *Teracolus hetaera*, Gerst.
56. *Teracolus evippe*, Linn.
[*f. epigone*, Feld.] D
59. *Teracolus ephyia*, Klug. D
60 *Teracolus hagore*, Klug. D
64. *Leuceronia buquetii*, Boisd. D
[*f. arabica*, Hopff.]
66. *Terias senegalensis*, Boisd. D
68. *Colias hyale marnoana*, Rogers D ?
69. *Papilio demodocus*, Esp. D ?
71. *Sarangesa eliminata*, Holl.
72. *Gegenes nostradamus*, Fab.
73. *Parnara mathias*, Fab. D ?
74. *Parnara fatuellus*, Hopff.
75. *Rhopalocampta forestan*, Cram.

These lists may be analysed by dividing A and B into sub-families.

	A	B
Satyrines	1	1
Nymphalines	2	3
Acraeines	3	2
Lycaenids	6	9
Pierines	2	14
Papilionines	1	1
Hesperids	5	5

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* It is not improbable that Capt. Wilson was so familiar with the typical form of *D. chrysippus* and with *P. cardui*, *H. misippus*, and *A. phalantha* that he did not think it worth while keeping specimens of those species.

Obviously the only really notable difference between them from this point of view is the very small number of new Pierines that Capt. Wilson collected. This may be in part explained—but only in part—by the fact that when on the White Nile I paid special attention to that group and sent home long series.

The extreme scarcity of Satyrines in the White Nile basin is very remarkable. To my *single specimen* of *Yphthima asterope* Capt. Wilson adds *two Mycalesis milyas.* In the nature of things positive observations have much more value than negative, and it is quite probable that a collector working throughout the year might find many more. My own observations in Cape Colony suggest that when Satyrines are scarcest Pierines are most abundant and *vice versâ.*

In the lists, I have marked with a D all the butterflies that I consider to be "desert" insects; this, of course, by no means implies that the species so marked are confined to "desert" areas; far from it. The D indicates that butterflies so marked—however extensive their distribution may be—are such as can live where "desert" conditions prevail.

Deserts differ *inter se*; some are much more barren than others, in some the prevailing surface is sand, in others rock, while some are shingly. Their common characteristic is aridity, an absence of rain for sufficiently long periods to stunt vegetation. Much depends upon season; Col. Yerbury says graphically: "Few . . . have any idea of the effect on 'the barren rocks of Aden' of a few heavy showers; how almost immediately, as if by magic, vegetation springs up in every ravine and watercourse, accompanied by a tolerably abundant insect fauna." * Under such circumstances the desert literally rejoices and blossoms as the rose.

The sand-dunes on our British coasts are true deserts, small though they be; on them *C. pamphilus*, *P. cardui*, *A. aglaia*, *C. phlaeas*, *L. icarus* and *astrarche* may generally be found among the bents, while now and then a *Colias* may be seen coursing over the sand; such are desert butterflies, though they may all be found inland living under very different conditions.

Looked at in this way, we see that whereas among

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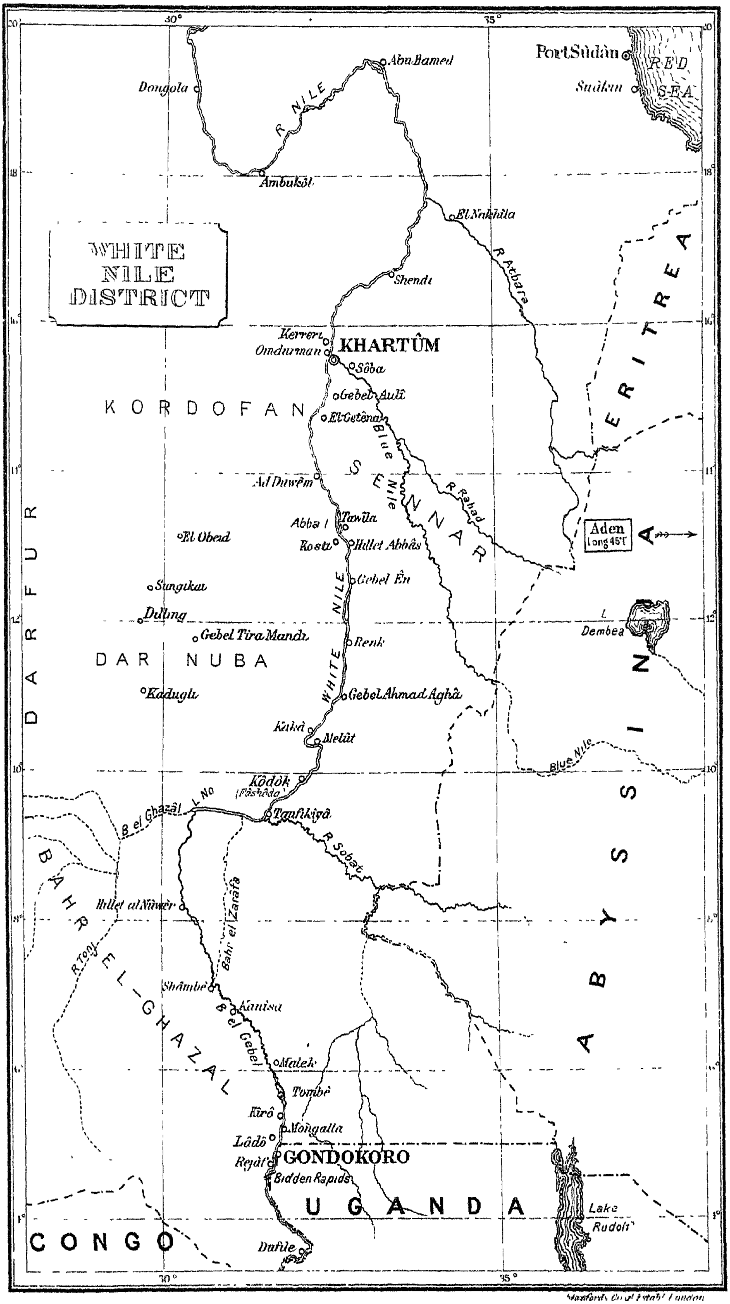
* Journal Bombay Nat. Hist. Soc., 1892, p. 208.

Capt. Wilson's twenty added species *four* only bear the D, no fewer than twenty-two of the White Nile species that he did *not* send home bear that mark.

Undoubtedly the fauna of Southern Kordofan has not the very marked desert character of that found nearer the river, but at the same time it can scarcely be deemed to be a forest fauna.

It is curious that of the ten Skippers not one is common to the two lists.

Capt. Wilson may be congratulated on having taken one species and two varieties new to science.



Stanford's Geog! Estab! London

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p.322.

XI. *On a Collection of Butterflies taken in East Africa by Mr. W. A. Lamborn.* By H. ELTRINGHAM, M.A., D.Sc. *With notes on the* Pierinae, by Dr. F. A. DIXEY. F.R.S., *and description of a new form of* P. dardanus ♀, by Prof. E. B. POULTON, F.R.S.

[Read June 6th, 1917.]

THE Hope Department at Oxford has recently received a Collection of *Lepidoptera*, chiefly *Rhopalocera*, taken in 1916 by Mr. W. A. Lamborn in the northern central part of what was German East Africa, and it may be not without interest to give particulars of one of the first consignments forwarded from one of our newly acquired territories.

The dates and localities with notes as to the type of country are as follows. The elevations are approximate.

May 3–6	New Moshi	37° 24′ E. 3° 24′ S.	Thin woodland, 2925 ft.
„ 10–11	Sanja River	37° 10′ E. 3° 28′ S.	Plain, 2900 ft.
„ 10–16	Arusha	36° 42′ E. 3° 20′ S.	Dense evergreen forest, 4550 ft.
„ 19–20	Kikuletwa-Darjama R., Noisinak Bridge.	37° E. 3° 30′ S.	Thorn-bush, 3500 ft.
„ 20	Loldiloi	36° 50′ E. 3° 36′ S.	Wooded borders of river, dry plains beyond, 3000 ft.
„ 22	Muruangom, Ssenje Drift	36° 42′ E. 3° 38′ S.	Thorn-bush, 3550 ft.
„ 26	Lolkissale	36° 26′ E. 3° 50′ S.	Thorn-bush, 4–5000 ft.
June 1–6, 19	Ufiomi (plain)	35° 50′ E. 4° 16′ S.	Dried plain, 4440 ft.
„ 2–6	Ufiomi (woodland)	35° 50° E. 4° 16′ S.	Green river gorge, woodland, with large trees.
„ 9	Ssalanga	35° 50′ E. 4° 30′ S.	Thorn-bush and woodland, 4500 ft.
„ 20	Taranjere River, 2½ m. S. of,	About 36° E. 4° S.	Thorn-bush and woodland, 3300 ft.
July 1	New Moshi	37° 24′ E. 3° 24′ S.	Thin woodland, 2925 ft.
„ 10	Tanga-Moshi Railway, Same.	37° 43′ E. 4° 8′ S.	Thorn-bush, 2900 ft.

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July 14	Tanga-Moshi Railway, Mabirioni, ("German Bridge")	37° 56′ E. 4° 36′ S.	Thorn-bush.
„ 23	Handeni	About 38° E. 6° S.	Woodland and thorn-bush, 2800 ft.
Sept. 6	Bagamoyo, 37 m. N. of Dar-es-Salam, on coast		Coco plantation, 100 ft.
„ 13	Ngerengere, on Central Railway, 100 m. W. of Dar-es-Salam.		Thick thorn-bush.
„ 30	Kondutschi, 10 m. N. of Dar-es-Salam, on coast		Coco plantation, 50 ft.
Nov. 10–14	Tanga	5° S. on coast.	Coco plantation, 50 ft.

At the above dates and localities the wet season prevailed until about June 16, when the dry began. The rain of the next change was first encountered on September 6.

DANAINAE.

Danaida formosa, Godm.

A nice series in fine condition.

Same, Mabirioni. 9 ♂♂, 3 ♀♀. May 16–July 14.

D. petiverana, Doubl.

Ufiomi (woodland). 1 ♂. June 4.

D. chrysippus, Linn.

Forty examples, of which only three are typical *chrysippus*. One approaches *alcippoides*, Moore, and three are of the *albinus*, Lanz, form. The rest are all *dorippus*, Klug.* The remarkable corresponding predominance of the *daira* form of *Acraea encedon* in this collection is referred to under that species.

All *dorippus* unless otherwise stated.

Kikuletwa, Darjama River (thorn-bush)—1 ♀ Mar. 19; Loldiloi (wooded river-side)—11 ♂♂, 1 ♂ *chrysippus*, 1 ♂

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* In Seitz' "Macrolepidoptera," Professor Aurivillius separates the *dorippus* form as a distinct species, with the remark that there is not sufficient evidence of its specific identity with *chrysippus*! *Any good series, however, shows many remarkable intermediates, and specimens in the Hope Department bred by the late Col. Manders show in a large number of specimens the instability of the fore-wing apical black. There can be no doubt that* dorippus *is a form of* chrysippus *just as* inaria *is a form of* misippus.

albinus May 20; Lolkissale (thorn-bush)—1 ♀ May 26; Same (thorn-bush) 4 ♂♂, 3 ♀♀, 1 ♀ *chrysippus* July 10; 1 ♂, 1 ♀, 1 ♂ *chrysippus*, 1 ♂ *albinus* July 11; Mabirioni (thorn-bush) 6 ♂♂, 5 ♀♀, 1 ♂ *chrysippus* (approaching *alcippoides*), 1 ♀ *albinus* July 14.

Amauris ochlea, Boisd.

Thirty examples, all typical.

Bagamoyo. 11 ♂♂, 19 ♀♀. Sept. 6.

A. damocles f. damoclides, Stgr.

Loldiloi. 1 ♂. May 20.

A. niavius dominicanus, Trim.

Mabirioni, Bagamoyo. 3 ♂♂. July 14–Sept. 6.

A. albimaculata, Butl.

New Moshi, Sanja R., Ufiomi (plains). 23 ♂♂, 5 ♀♀. May 3–June 6.

[NOTE.—*A. echeria* is rare in Kikuyu, common on Kilimanjaro (Rogers, Trans. Ent. Soc., p. 511, 1908), and *albimaculata* relatively very rare at Entebbe.]

SATYRINAE

Gnophodes parmeno diversa, Butl.

A single example of the southern and eastern race of *G. parmeno*.

Ufiomi (woodland). 1 ♀. June 3.

Neocoenyra duplex, Butl.

A single example, apparently of this species, though differing from typical examples in having the fore-wing eye spot area merely dusted with red brown scales, instead of being distinctly red brown.

Ufiomi (woodland). 1 ♂. June 4.

Physcaeneura leda, Gerst.

Six specimens somewhat variable in size, but otherwise normal.

Tanga. 5 ♂, 1 ♀. Nov. 10–14.

ACRAEINAE.

Acraea quirina, Fab.

Five females of the usual brownish form. The note accompanying these examples describes the locality as dense evergreen forest. This may account for the absence of male specimens, which probably frequent more open situations.

Arusha. 5 ♀♀. May 16.

A. neobule, Doubl.

Five examples of this widely distributed species, all of typical pattern and colour.

Ufiomi (plains), Muruangoin, Same. 5 ♂♂. May 22–July 10.

A. zetes, Linn.

One male of the *acara* form so greatly modified in resemblance to *A. pseudolycia astrigera*, Butl., that the male armature gives the principal evidence of its distinction from that species. *Zetes* and *pseudolycia* are certainly closely allied, and the resemblance would appear to be due to affinity rather than to mimetic association.

Kikuletwa-Darjama River. 1 ♂. May 19.

A. insignis, Dist.

A single female approaching the *siginna* form.

Handeni. 1 ♀. July 23.

A. chilo, Godm.

Of the twelve examples received, ten are of the *crystallina* form of female, the remaining two are males of the ordinary form. It is remarkable that whereas the female *chilo* becomes more transparent as it extends southward, the female *braesia*, and to some extent its male also, becomes more transparent towards the northern limit of its range. The male *chilo*, on the other hand, shows some tendency to heavier spotting as it extends southward. The localities where the present examples were taken are further south than any yet recorded.

Same, Mabirioni. 2 ♂♂, 10 ♀♀. July 10–14.

A. egina, Cram.

Ten specimens, three of which are distinctly of the form *harrisoni*, Sharpe, whilst two other males have slight red streaks in the fore-wing apical area. The *harrisoni* form has previously been reported from Bukoba, L. Kivu district, by Grünberg, who renamed it *kivuensis*, and occasional examples have been noted from Uganda to Nyassa Land. It is merely an intermediate between the type and the form *areca*, Mab.

Ufiomi. 7 ♂♂, 3 ♀♀. June 2–19. (One *harrisoni* ♂, June 2, woodland, the rest plains.)

A. acrita manca, Thur.

A fine series of this interesting form. The characteristic fore-wing subapical spots show considerable variation in number and size, and in one or two examples they are present only on the underside. The fore-wing apical black is slightly broader and the black rings on hind-wing margin are more pronounced than in typical *manca*. The examples are thus to some extent intermediate between *manca* and *manca* f. *lidica*. Nearly all the females have a brownish ground-colour, though in one or two examples there is in the hind-wing a tendency towards the typical flame orange of the male. The wet season continued till about June 16, so that these females are fairly consistently of the wet form.

Ufiomi (plains). 19 ♂♂, 21 ♀♀. June 1–6, 19 (woodland). 1 ♂, 1 ♀. June 5; Ssalanga. 2 ♀. June 9.

A. caldarena f. neluska, Oberth.

Two examples of this form occur. They present no unusual features. The form is rather rare in collections.

Handeni. 1 ♂, 1 ♀. June 23.

A. pudorella pudorella, Auriv.

One dwarf male example.

Ufiomi (plains). 1 ♂. June 1.

A. braesia braesia, Godm.

In a long series of this species there is one male example of the *regalis* form, and several somewhat intermediate thereto. No specimen shows the peculiarities of the

Somaliland form mentioned in my monograph, though several of the females are more than usually transparent.

Ufiomi (plains), Same, Tanga Moshi Ry., Ssalanga, Mabirioni, Handeni. 34 ♂♂, 8 ♀♀. June 5–July 23.

A. equatorialis, Neave.

A single male example in fine condition, presenting the coloration of true *equatorialis* combined with the larger size so usually found in *equatorialis anaemia*, Eltr. Also one other specimen of the *anaemia* form, unfortunately without data.

Kikuletwa-Darjama R. 1 ♂. May 19.

A. natalica natalica, Boisd.

Five examples of this common species all of typical appearance.

New Moshi, Sanja R. 4 ♂♂, 1 ♀. May 6–11.

A. anacreon, Trim.

Two examples of this species were taken, one male and one female. Though somewhat faded and worn they are interesting as showing an intermediate condition between *anacreon bomba* f. *induna*, Trim., and *anacreon anacreontica*, Gr. Sm. As in the latter, the fore-wing apical black is very much reduced and the outer half of the wing is ochreous; the base of fore-wing and the whole hind-wing is deep orange as in the *induna* form. They thus support my contention that *anacreon*, *bomba*, and *anacreontica* are all forms of the same species. The resemblance of the female example to the specimens of *acrita manca*, with which it was taken, is very striking.

Ssalanga. 1 ♂. June 9.
Ufiomi (plains). 1 ♀. June 19.

A. encedon, Linn.

Of twenty-one examples there is no specimen of true *encedon*. The *daira* form largely predominates, and *alcippina* is absent. It is interesting to note that of forty examples of *D. chrysippus* in the same collection, three are typical, one is the *alcippus* form, three *albinus*, and all the rest are of the *dorippus* form to which *encedon* f. *daira* corresponds.

Daira.—New Moshi (thin woodland). 5 ♂♂ May 6;

Sanja River (plains) 2 ♀♀ May 10; Arusha (dense forest) 1 ♀ May 10, 2 ♀♀ May 16; Muruangoin (thorn-bush) 1 ♂ May 22; Ufiomi (plains) 1 ♀ June 2; (woodland) 1 ♀ June 5; Mabirioni (thorn-bush) 2 ♂♂ July 14; Handeni (woodland and thorn) 1 ♀ July 23.

Encedon (near *infuscata*)—Arusha 1 ♀ May 16.

Encedon, worn, with rather dull coloration—Ufiomi (woodland) 1 ♀ June 4; Mabirioni 1 ♂ July 14.

Lycia—New Moshi 1 ♀ May 6; Handeni 1 ♂ July 23.

The above analysis of localities shows that there is little or no correspondence between the form and the character of the habitat.

A. sotikensis, Sharpe.

All the specimens are of the form *rowena*, Eltr., distinguished from the typical form by having the inner marginal part of hind-wing patch yellow instead of red. This form has hitherto only been reported from Mt. Ruwenzori.

Ufiomi. 8 ♂♂, 2 ♀♀. June 1–5 (1 ♂, 2 ♀♀ plains, the rest woodland).

A. cabira, Hoppf.

Three examples of the typical form not calling for special comment.

Arusha, Sanja R., Mabirioni. 3 ♀♀. May 10–July 14.

A. acerata, Hew.

Three examples in marking somewhat intermediate between the type and the *vinidia* form. One female is intermediate to the form *tenella*.

Ufiomi (woodland). 1 ♂. June 4.
New Moshi. 2 ♀♀. July 1.

A. terpsichore, Linn.

A long series of this abundant species. All the males are of the form *rougeti*, Guer. The females are not so variable in form as is usual in this species. Four resemble the males, the remainder are largely of the form having dusky fore-wings with more or less whitish subapical patch, one or two having a great deal of white on the fore-wing. Only two of the males have any red marks on the hind-wing underside.

Kikuletwa-Darjama R., Ufiomi, Same, Handeni, New

Moshi. 9 ♂♂, 34 ♀♀. (5 ♂♂, 27 ♀♀. Ufiomi plains, 1 ♀ woodland.) May 19–July 23.

A. pharsalus, Ward.

Two males of the form *pharsaloides*, Holl., which seems generally to replace the typical form in these localities.
New Moshi, Arusha. 2 ♂♂. May 6–16.

A. perenna, Doubl.

One female example of the form *thesprio*, Oberth., in which the red colour extends over the greater part of the fore-wing.
New Moshi. 1 ♀. May 6.

A. oreas, Sharpe.

Two examples of which the male is of the *albimaculata* form, the other, a female, has the tip of the left fore-wing sienna brown instead of black.
Arusha. 1 ♂, 1 ♀. May 13–16.

A. esebria, Hew.

A series showing the usual variability. The majority are of the form *jacksoni*, Sharpe. Two are of the form *protea*, Trim.; one female is form *monteironis*, Butl., and one female intermediate between *monteironis* and *nubilata*, Eltr.
Arusha, Ufiomi (woodland), Same, Mabirioni. 9 ♂♂, 6 ♀♀. May 14–July 14.

A. lycoa, Godt.

Two examples of the form *fallax*, Rogenh. This is the most southern locality I have for this form.
Arusha. 2 ♀♀. May 10–13.

A. johnstoni, Godm.

One male is typical. The other two are of the variety of *confusa*, Rogenh., which has the hind-wing discal patch white as well as the fore-wing spots. (See Trans. Ent. Soc., p. 342, 1912.)
New Moshi, Mabirioni. 3 ♂♂. July 1–14.

Planema aganice montana, Butl.

Kikuletwa-Darjama R., Ufiomi (woodland), Mabirioni, Arusha. 1 ♂, 8 ♀♀. May 16–July 14.

P. quadricolor, Rogenh.

Arusha. 1 ♀. May 13.

Pardopsis punctatissima, Boisd.

Same. 1 ♂, 1 ♀. July 10.

With reference to the position of this species Professor Aurivillius expresses the opinion (in Seitz' "Macrolepidoptera") that pending a knowledge of the early stages it should remain with the Acraeinae, with which it agrees in certain particulars, including the structure of the fore-legs. I was at some pains in my monograph of the Genus *Acraea* to point out that the species does not agree with *Acraea* in this last particular.

NYMPHALINAE

Euxanthe wakefieldi, Ward.

Handeni. 1 ♂, 1 ♀. July 23.

Charaxes etheocles, Cr.

New Moshi. 1 ♂. May 6.

C. candiope, Godt.

Ufiomi (woodland). 1 ♂. June 4.

C. cithaeron, Feld.

Kikuletwa-Darjama R. 1 ♂. May 19.

C. zoolina, Westw.

This dimorphic species is represented by two examples, one *zoolina* and the other *neanthes*, Hew.

Kikuletwa-Darjama R. ♀ (*zoolina*). May 20 (wet season).

New Moshi. ♂ (*neanthes*). July 1 (dry season).

C. baumanni, Rogenh.

Ufiomi (woodland). 1 ♂. June 2.

Euryphura achlys, Hoppf.

Ngerengere. 2 ♂♂. Sept. 13.

Euryphene senegalensis orientis, Karsch.

Kondutschi. 4 ♂♂, 2 ♀♀. Sept. 30.

Ephaedra neophron, Hoppf.

Two males of the ordinary form, and one male which appears to be a rather worn and faded specimen of the form *violacea*, Butl.

New Moshi. 1 ♂ (*violacea*). May 6.
Ngerengere. 2 ♂♂ (*neophron*). Sept. 13.

Hamanumida daedalus, Fab.

Handeni. 1 ♂. July 23.

Neptis agatha, Stoll.

Ufiomi (plains). 2 ♀♀. June 1.

N. saclava marpessa, Boisd.

The *marpessa* form is the continental representative of the Madagascar *saclava*, and is very widely distributed.

Ufiomi (woodland). 2 ♀♀. June 5.

Byblia ilithyia, Drur.

Same. 1 ♂, 1 ♀. July 10.

B. acheloia, Wallingr.

Wet f. *vulgaris*, Stgr.
Ufiomi (woodland). 1 ♂. June 2.

Eurytela hiarbas lita, R. & J.

The East African race of *hiarbas*, Drur.
Ufiomi (woodland). 1 ♂. June 2.

E. dryope angulata, Auriv.

The early stages of *hiarbas* and *dryope* are, according to Miss Fountaine, indistinguishable, though their specific identity seems not yet to have been established.

Ufiomi (woodland). 1 ♀. June 4.

Hypolimnas misippus, Linn.

One female of the typical form.
Same. 1 ♀. July 11.

Hypolimnas dubia, Pal.

Four examples of the *wahlbergi* form, showing considerable variation in size, the smallest 70 mm. in expanse and the largest 100 mm. Also four specimens of the *mima* form, of which one, a large female, has the hind-wing pale area white dusted with yellow.

Arusha, Mabirioni. 4 ♂♂ (*wahlbergi*). May 14–July 14.

Ssalanga, Ufiomi (woodland). 2 ♂♂, 2 ♀♀ (*mima*). June 4–9.

Pseudacraea lucretia expansa, Butl.

Handeni. 1 ♀. July 23.

Salamis parhassus aethiops, Pal.

Two fine examples. The species differs from *anacardii*, L., in having a glossy surface on the underside of both wings.

Ufiomi (woodland). 2 ♀♀. June 4.

Pyrameis cardui, Linn.

A female of this ubiquitous species taken at an elevation of 4500 ft.

Ssalanga. 1 ♀. June 9.

Catacroptera cloanthe obscurior, Stg.

One female of the dry form of *cloanthe*, though taken towards the end of the wet season.

Ufiomi (plains). 1 ♀. June 2.

Precis octavia, Cram.

A series of this species of which twelve are of the *sesamus* or dry season form, and one *natalensis*. The first example of *sesamus* was taken on June 2, and the wet season continued till about June 16. The remaining dates extend to June 19. One *sesamus* taken June 19 shows, by the red in the fore-wing cell, an approach towards an intermediate form and to the usual dry form of the west coast.

Ufiomi. 6 ♂♂, 6 ♀♀ (*sesamus*). June 2–6, 19 (3 ♂♂, 6 ♀♀ taken June 19, under eaves of native hut, Ufiomi plains; 3 ♂♂ in woodland, June 2–5).

Ufiomi (woodland). 1 ♀ (*natalensis*). June 4.

P. limnoria taveta, Rogenh.

New Moshi, Same. 1 ♂, 1 ♀. May 6–July 11.

P. antilope antilope, Feisth.

The dry season form.
Handeni. 1 ♂. July 23.

P. terea elgiva, Hew.

Ufiomi (woodland). 1 ♂. June 6.

LYCAENIDAE.

Teriomima freya, S. & K.

Handeni. 4 ♂♂ (one doubtful). July 23.

Spalgis lemolea, Druce.

Tanga. 1 ♂. Nov. 10–14.

Uranothauma falkensteini, Dew.

Ufiomi (woodland). 1 ♂. June 4.

Virachola antalus, Hoppf.

Ufiomi (plains). 1 ♀. June 2.

Polyommatus boeticus, Linn.

Ufiomi (plains). 1 ♂. June 2.

Azanus mirza, Plotz.

New Moshi. 2 ♂♂. May 3.

Azanus sigillatus, Butl.

New Moshi. 1 ♂. May 3.

PIERINAE.

Terias brigitta, Cram.

New Moshi. 1 ♂. May 3.

Terias regularis, Butl.

New Moshi, Tarangere R., Ufiomi (woodland). 9 ♂♂. May 3–June 20.

Teracolus eupompe, Klug.

Tarangere R. 1 ♂. June 20.

Teracolus evagore, Klug.

The form *antigone*, Boisd.
Same. 1 ♂. July 11.

Teracolus halimede, Klug.

Tarangere R. 9 ♂♂, 4 ♀♀. July 10–11.

Teracolus chrysonome, Klug.

Loldiloi, Ufiomi (plains), Tarangere R. 3 ♂♂, 9 ♀♀. May 20–June 20.

NOTE.—From the last-named locality there were eight females and only one male.

Teracolus protomedia, Klug.

Same. 1 ♀. July 10.
"Damaged before capture."

Colias electo, Linn.

Ufiomi (plains). 4 ♂♂, one being white. June 2–3.

Eronia leda, Boisd.

Handeni. 1 ♂. July 23.

Eronia cleodora, Hübn.

Handeni, Mabirioni. 1 ♂, 1 ♀. July 14–23.

Leuceronia argia, Fabr.

Ufiomi (woodland), Handeni. 3 ♂♂. June 3–July 23.

Leuceronia thalassina, Boisd.

Ufiomi (woodland). 1 ♀. June 3.

Leuceronia buquetii, Boisd.

Handeni, Same. 1 ♂, 1 ♀. July 11–23.

Pinacopteryx vidua, Butl.

Ufiomi (woodland). 1 ♀. June 5.

Pinacopteryx pigea, Boisd.

New Moshi, Ufiomi. 4 ♂♂. May 6–June 4.

f. astarte, Butl.

Ufiomi (woodland). 1 ♂. June 4.

Belenois severina, Cram.

Tarangere R., Ufiomi, Same. 1 ♂, 2 ♀♀. June 4–July 11.

Belenois mesentina, Cram.

Handeni. 1 ♂. July 23.

Belenois margaritacea, Sharpe.

Ssalanga. 1 ♂. June 9.

Mylothris agathina, Cram.

Ufiomi, Handeni. 6 ♂♂, 5 ♀♀. June 2, 19, July 23. 1 ♂, 4 ♀♀ Ufiomi (plains); 2 ♂♂, 1 ♀ (woodland).

Nychitona medusa f. alcesta, Cram.

Ufiomi (woodland). 4 ♂♂, 4 ♀♀. June 2–6.

PAPILIONINAE.

Papilio nireus lyaeus, Doubl.

Differs from true *nireus* in having a much shorter blue spot in area 2 of hind-wing.

New Moshi. 9 ♂♂. May 3.

P. leonidas leonidas, Fab.

One female example, unfortunately without data.

P. dardanus tibullus, Kirb.

♀ f. nov. **lamborni,** Poult.

The single female was captured June 3, 1916, at Ufiomi (woodland). A male was taken in the same locality on June 6; a second on June 9 at Ssalanga, and a third on July 14 at Mabirioni.

The female is an extremely interesting form, being very similar to that described from much further north in Trans. Ent. Soc., 1906, p. 290—a *trophonius* form from the Kikuyu

Escarpment (6500–9000 ft.) near Nairobi, with the pale markings not white but retaining the primitive yellowish tint of *trimeni*, and the broad orange marking incompletely developed, so that it does not quite fill its usual area, the outer end of the fore-wing patch remaining yellowish. It was pointed out in the paper referred to, that this specimen supported the conclusion that *trophonius* had arisen direct from *trimeni* and not indirectly from it by way of *hippocoon*. The existence of another specimen of the same form from a very different locality affords confirmation. The differences between the two specimens are only such as are found between different individuals of each of the female forms of *dardanus*. Thus, the southern specimen from a lower altitude is considerably larger, being just over 90 mm. in expanse as against just under 80 mm.; but a small size is characteristic of both males and females of *dardanus polytrophus* from the high Kikuyu Escarpment. The southern specimen is darker and richer in colouring, but this difference is intensified by its freshness; its hind-wing orange patch is squarer, with a more pronounced angle in area 5, and is more encroached upon by the broader black margin. A vestige of the "tail" involving the lengthening of vein 4 is seen in the northern specimen but not in the southern, just as it is present in some *trimeni*, but not in others.

In the fore-wing the band of black ground-colour between the sub-apical bar and the orange patch on the inner margin is about twice as wide in the southern specimen, and there is also far less invasion of the cell by this orange patch. Furthermore the sub-apical bar and the spot in the cell are fused in the Kikuyu example, quite distinct in the southern. The cell spot itself is double in the latter, single in the former.

In spite of these and other differences both females belong to a characteristic form for which I propose the name *lamborni*. It may be defined as a *trimeni* form in which the yellowish ground-colour of the main area of both wings is replaced, but incompletely in the fore-wing, by orange. The specimen from Ufiomi is probably more typical, and I therefore select it as the type of this female form.

The three males are all of the *tibullus* form with the black discal band of the hind-wing heavily marked, although not so strongly developed as it commonly is in this sub-species. The band of the specimens taken June 6 and June 9 shows in area 5 a marked "costal gap," closed on its outer side by a narrow black V with apex outwardly directed. In the male of July 14 a slight indication of the "anal gap" is represented by a thinning of the black band, from without inwardly, in area 3.

The pattern of these three males together with the geographical distribution of all four specimens shows that this *lamborni* female belongs to the subspecies *tibullus*. The Kikuyu example of this form, on the other hand, belongs to *polytrophus*.

E. B. P.

HESPERIIDAE.

Tagiades flesus, Fab.

Ufiomi (woodland). 1 ♂. June 6.

Cyclopides, sp. ?

One example not yet identified. This specimen is evidently closely allied to *Cyclopides trisignatus*, Neave, from which it differs principally in the total absence of orange spots in the hind-wing.

Ufiomi (woodland). June 6.

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4

DESCRIPTION OF A NEW SPECIES OF *PSEUDONYMPHA* (*SATYRINAE*) FROM SOUTH AFRICA.

BY ROLAND TRIMEN, M.A., F.R.S.

PSEUDONYMPHA DETECTA, *sp. nov.* (Plate XII, ff. 3–6).

Closely allied to, and intermediate between, *P. cassius* (Godt.), and *P. vigilans*, Trim., but nearer to the former.

Exp. al. (♂) 1″3½–6‴; (♀) 1″3½–5‴

♂. Greyish-brown; fore-wing with a large disco-cellular and discal deep-fulvous patch; hind-wing with a small discal patch of the same deep-fulvous, not far from hind-margin, between 1st and 3rd median nervules. *Fore-wing*: a well-defined moderate-sized, sub-apical, ovate, black, bluish-bipupillate ocellus in a distinct pale-yellowish, outwardly fuscous-edged ring; fulvous patch occuping discoidal cell from near base, and extending beyond it, superiorly to lower edge of ocellus, and inferiorly below median nervure and its first nervule, but bounded externally by a sub-marginal rather indistinct transverse dark-brown line, commencing on costa beyond ocellus; this patch is in three examples somewhat indistinctly crossed—in one example obscurely *divided*—by a shorter dark brown line just beyond extremity of discoidal cell. *Hind-wing*: small discal fulvous patch bounded externally by a rather faint sub-marginal dark-brown line, and in three examples marked on its outer edge between 2nd and 3rd median nervules with a minute unipupillate ocellus.

UNDER-SIDE. Costa and apical area of fore-wing and entire hind-wing pale brownish-grey, more or less closely hatched and flecked generally with short, irregular, thin, brown striolæ and dots. *Fore-wing*: fulvous patch extending to base itself. *Hind-wing*: two transverse angulated brown streaks, one before the other about middle, usually rather indistinct, and in two examples not traceable; usually two minute unipupillate ocelli—the additional one between 1st and 2nd median nervules; and also a third situated sub-apically between sub-costal nervures.

♀. Like ♂. *Hind-wing*: on under-side, in one of the two examples, the minute ocelli between 2nd and 3rd median nervules are wanting; and in both the median transverse streak is only faintly discernible.

Differs from *P. cassius* on the *upper-side* of fore-wing in the much larger fulvous space, which begins much nearer base and rises higher in discoidal cell; and of hind-wing in possessing a small fulvous discal patch on median nervules, while the conspicuous two sub-marginal ocelli near anal angle in *cassius* are either wanting altogether or only the upper one of them is very minutely represented. On the *under-side* in the *fore-wing* the fulvous space is not so much more developed than in *cassius* as it is on upper-side; while in the hind-wing the three small ocelli are very minute or obsolescent; and the ground-colour of both wings is much greyer and paler, and its striolation and two transverse angulated streaks are much fainter and without the strong rufous tinge so pronounced in *cassius*.

This form of *Pseudonympha* agrees with *P. vigilans* on the *upper-side* as regards the possession of the small fulvous patch on median nervules of hind-wing, but differs in having a larger fulvous area in fore-wing ; it differs further *on both surfaces* in the smaller, less circular, but more conspicuously yellowish-ringed ocellus of the fore-wing, and in wanting or presenting only in very minute form the two (sub-apical and sub-anal-angular) ocelli on the *under-side* of the hind-wing ; also this last-named surface is less densely striolated and freckled generally, leaving the two transverse irregular striæ more pronounced.

As long ago as October 21st, 1863, I took two ♂ ♂ of this *Pseudonympha* in Bain's Kloof, the mountain road between Wellington and Worcester, in the south-western district of Cape Colony. I regarded these at the time as a variation of *P. cassius*, but have always kept them in my collection of South African butterflies not among but just apart from my series of *cassius*. Dr. Longstaff's most interesting re-discovery—after so long an interval as fifty years—of this form in both sexes, occurred at Caledon, in the same south-west district of the Cape Province (but perhaps between 30 and 40 miles south-west of Bain's Kloof), five males and two females having been captured by him from January 23rd to February 3rd, 1914.

Mr. N. D. Riley pointed out to Dr. Longstaff that in the British Museum (Natural History) there is a single ♀ *Pseudonympha* identical in characters with the specimens above diagnosed as *P. detecta*, n. sp. This example formed part of the series of *P. cassius* in the Hewitson Collection, received by the Museum about the year 1878, but bears no record of date of capture, or label of locality beyond that of "South Africa."

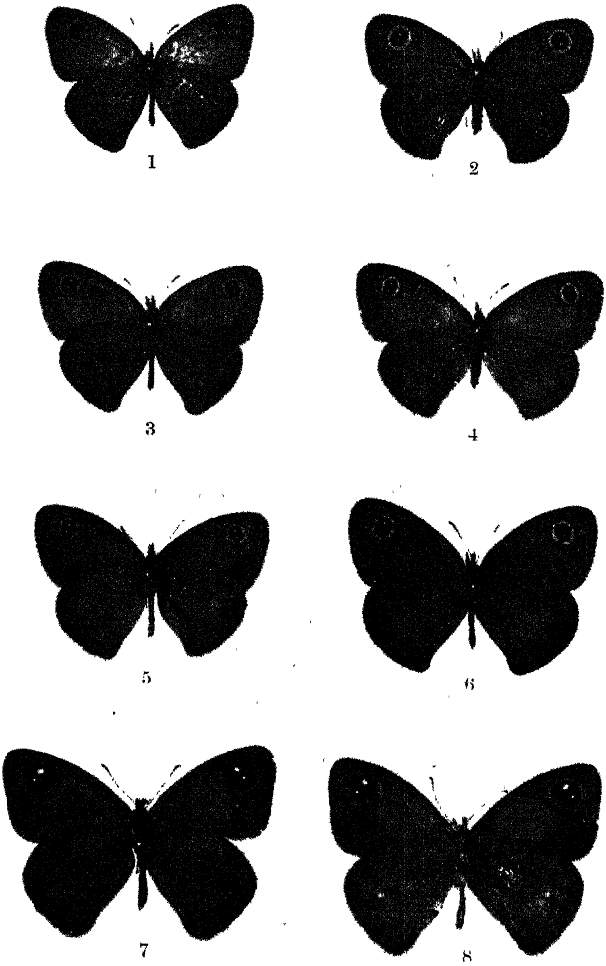
EXPLANATION OF PLATE XII.

SOUTH AFRICAN *SATYRINAE* OF THE GENUS *PSEUDONYMPHA*.

Fig. 1.—*Pseudonympha cassius*, Godart, ♂ ; Caledon, Jan. 23rd, 1914.
Fig. 2.—*P. cassius*, ♀ ; Knysna, Feb. 20th, 1914.
Fig. 3.—*P. detecta*, Trimen, ♂ ; Caledon, Jan. 29th, 1914.
Fig. 4.—*P. detecta*, ♀ ; Caledon, Feb. 2nd, 1914.
Fig. 5.—*P. detecta*, under-side ; Caledon, Feb. 3rd, 1914.
Fig. 6.—*P. cassius*, under-side ; George, Feb. 15th, 1914.
Fig. 7.—*P. vigilans*, Trimen, ♂ ; Table Mt., March 16th, 1914.
Fig. 8.—*P. vigilans*, Trimen, ♀ ; Table Mt., March 16th, 1914

Glaslyn, Waterden Road, Guildford :
October 10*th*, 1914.

Plate XII.



Engravers Guild, Ltd.

PSEUDONYMPHA CASSIUS, 1 ♂, 2 ♀, 6 under side.
P. DETECTA, 3 ♂, 4 ♀, 5 under side.
P. VIGILANS, 7 ♂, 8 ♀.

[*Reprinted from the 'Entomologist's Monthly Magazine,'* 3rd ser., vol. vii.]

FOUR NEW AFRICAN SPECIES OF *NEPTIS*.

BY H. ELTRINGHAM, M.A., D.Sc.

Being engaged on a systematic investigation of the African species of the Nymphalid genus *Neptis*, I find four hitherto undescribed forms, of which I submit the following account:—

Neptis poultoni, sp. n.

Expanse 38–42 mm. Ground-colour dark sepia with white markings. Fore wing with an inner marginal patch in 1 *a* and 1 *b*, the proximal edge of which forms a straight line continuous with that of the hind-wing discal band. In 2 and 3 are large contiguous spots forming a subovate patch of regular outline. In area 4 a minute white dot placed distally. In 5, 6, and 10 contiguous spots forming a large subapical patch. Distal to the white markings and roughly following their contour a line somewhat paler than the ground-colour, followed by a band of more or less rounded dark internervular marks, this followed again by three paler lines forming a hind-marginal border. Fringes dotted white between the nervules. Hind wing with a white discal band of regular outline, 4 mm. wide on inner margin and rather broader in 5, thence narrowing to a small spot in 7. Distal to the white band a border similar to that on fore wing.

Underside. Ground-colour paler than above. Costa white at base and as far as cell end. In cell a white line on subcostal curving outwards and downwards, its end pointing to origin of nervule 3. On end of cell a white transverse line, and beyond this, indications of a second indistinct line. Discal white spots as above, but subapical patch extends into 10. The border ornamentation of pale lines much accentuated, owing to increased whiteness of lines, and an additional fine marginal line.

Hind wing brown at base, but with a *conspicuous curved white costal bar from base to end of* 8. Two indistinct narrow whitish streaks on dark ground. Discal band as above, and beyond it a border of same pattern as in fore wing.

2 ♂ ♂, Chigwe, Mabira Forest, nr. Kampala. Taken by Dr. S. A. Neave, 24.vii.1911. Type in British Museum.

Neptis poultoni closely resembles *nemetes nemetes* Hew., and also, but less closely, *trigonophora* Butl. From *nemetes* it is at once distinguished by the curved white distal band in hind-wing underside, and from *trigonophora* by the underside pattern of the hind margins of both wings. The male armature is quite distinct.

Neptis barnsi, sp. n.

Expanse 55–60 mm. Ground-colour sepia-black with white markings. Five white dots in cell of fore wing, and traces of two minute dots beyond. An inner marginal white patch of two elongated spots in 1 *a* and 1 *b*, their proximal edges straight, outer ends slightly separated. In 2 and 3 two white marks, proximally just separated by nervule 3, but distally more widely divergent. In area 4 an obsolescent white streak (in some co-types well developed). In 5 and 6 elongated spots divided by nervule 6 and distally divergent. A small spot in 9 near costa. Distal to white markings and roughly following their contour a fine line of bluish-grey scales which is thrown into a series of arches between the nervules. Following this, three bluish-grey lines continuous except at the nervules. Fringes spotted white between the nervules.

Hind wing with a discal white band about 5 mm. wide, rather narrower at inner margin, slightly projecting proximally at median, and extending to area 6. Distal edge of band indented on nervules by the ground-colour and slightly powdered with black between. Three bluish-grey submarginal lines as on fore wing, and midway between the innermost of these and the discal band a narrow line somewhat paler than the ground-colour.

Underside. Ground-colour paler than above. Fore-wing costa white at base and nearly to cell end. In cell a series of rather complicated white markings, consisting of a basal streak terminating in a spot, a transverse streak, two small spots, and two at each cell end. Beyond this, three or four very small spots. Large white marks as on upper side, that in 4 more fully developed, the pale lines all much more accentuated but white, not bluish-grey, and there is a trace of an additional fine line at and below the apex.

Hind wing with a large curved white costal band from base nearly to end of 8, followed by two less definite white bands on the brown ground-colour. Discal band as on upper side, and rest as on fore wing.

8 ♂♂. Type, Belgian Congo, between Ituri and Epulu Rivers (*Barns*), March 1920 (*Coll. Joicey*).

Co-types, Bitje, Ja River (1), Upper Kassai (5), Semliki Valley (1).

This species closely resembles *seeldrayersi* Auriv., from which it may generally be distinguished by the obsolescent character of the streak in fore-wing area 4, and by the fact that the pale line on fore wing immediately distal to the discal markings is deeply arched (distally convex) between the nervules. The male armature is quite distinct from that of any other described species.

Neptis rothschildi, sp. n.

Expanse 50–55 mm. Sepia-black with white markings. Fore wing with a white cell streak, beginning at base and passing between nervures 4 and 5 to a point considerably beyond the origin of 3. Elongated inner marginal spots in 1 *a* and 1 *b*, distinctly separated. Two similar discal spots in 2 and 3 still more separated. A white dot distally placed in area 4, and a series of three well-separated elongated spots or streaks in 5, 6, and 9. Distal to these discal spots and following their contour a very fine line of greyish-white scales. Beyond this a well-developed white line, broken into spots by the nervules. Finally two delicate submarginal lines.

Hind wing with a discal band about 3–4 mm. wide from inner margin to nervule 6, the spots of which are distinctly separated by the nervules. Distal to this a very faint line, rather paler than the ground-colour, followed by a narrow white secondary band of quadrate spots separated by the nervules. Two delicate submarginal lines.

Underside. Pattern of upper side repeated, but the white marks more pronounced on a paler ground. Fore wing white on costa at base. Cell streak larger and more sharply outlined. Above end of cell two or three additional white streaks. White submarginal bands much more distinct, especially inner one, which is widened to about 1·5 mm., and there is an extra distal line at apex.

Hind wing with a white costal band from base to middle of costa. The secondary discal band composed of spots much larger than above.

2 ♂♂. Type, Kingour Forest, Manyema, Congo Free State (no date) (*Mus. Tring*).

Co-type, Upper Kassai (no date) (*Coll. Joicey*).

This species most nearly resembles *paula* Staud, but is quite differently marked in fore-wing cell above and below. Ward's *biafra* is also similar, but has three transverse white stripes in cell. All three differ from other described species in having a secondary white discal band on the hind wing. The male clasper of the present species is quite different from that of *paula*. I have not had an opportunity of examining that of *biafra*.

Neptis rogersi, sp. n.

Expanse about 50 mm. Sepia-black with white markings. Fore wing cell with three or four white dots and three beyond it. An inner marginal white patch of two spots in 1 *a* and 1 *b*. Two large subquadrate spots in 2 and 3 separated proximally by the nervule, and distally by a slight invasion of the ground-colour. In 4 a small subtriangular spot, distally placed. Three subapical spots in 5, 6, and 9, the first two subquadrate, distally divergent, and the third a small streak. Just distal to the white discal marks a white line roughly following their contour. This line is not arched between the nervules. Following this, two fine submarginal lines with faint indications of a third, the first breaking into three small but rather conspicuous spots near the costa.

Hind wing with a white discal band 7–8 mm. wide, straight, and sharply defined proximally, regular but invaded by the black nervules distally. The outer edge of the band is closely followed by a pale line, and there are three more pale lines foiming a marginal border. Fringes white between nervules.

Underside. Not markedly paler than above. All the lighter markings chalky white. Fore-wing with white at base of costa and a complicated pattern of lines and spots in cell. In the type form there is in the cell a line along the subcostal having two downward projections, between which is a small spot. Just beyond end of this line another spot, and on the median side three spots, one longitudinal and two transverse. Four or five small spots beyond cell. (In the co-type two of the spots coalesce to form a transverse line across cell end.) The spot in 4 is very little larger beneath than above, but more sharply defined and definitely triangular. The discal and submarginal lines are broader and more distinct, only separated by fine dark lines.

Hind wing with a curved white costal band, but this much narrower than in *barnsi* and *seeldrayersi*. This followed by two very distinct curved white bands. White discal band very broad and extending from inner margin to area 7. Other lines as on fore wing.

2 ♀ ♀. Rabai, 26.vi.1999 and 15.vii.1911 (*Rev. K. St. A. Rogers*). Type, Oxford.

I hesitate to describe a species from ♀ ♀ only, but the two examples from which the above account is compiled do not correspond with any other forms in the collections which I have examined. They are at once distinguished from *agatha* and *seeldrayersi* by the small spot in fore-wing area 4, whilst they differ from *barnsi* in the straight formation of the fore-wing discal line bordering on the large white spots. Also in the much narrower hind-wing basal costal band and in the pure white markings of the underside.

I hope shortly to be able to publish figures of the above forms together with a revision of all the known African species.

Hope Dept., University Museum, Oxford:
December 1920.

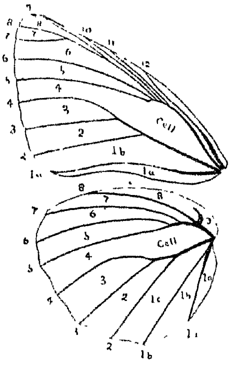
6

XIII. *On the African Species of the Genus* Neptis *Fab.* By H. Eltringham, M.A., D.Sc., F.Z.S.

Plates XX—XXV.

[Read Oct. 5th, 1921.]

The Genus *Neptis* was founded by Fabricius in 1807. It includes many species of small or medium-sized butterflies usually characterised by white or yellow markings on a sepia black ground-colour. Two species occur in Europe. The genus extends over the whole of the African and Oriental regions and into Australia. The wing neuration is as shown in the accompanying diagram. Its arrangement is fairly constant, though there is a certain instability in the point of origin of the tenth nervule in the fore-wing, which may arise at or beyond the end of the discoidal cell. The fore-feet are of the usual Nymphalid character, and serve as an easy method of distinguishing the sexes. The hind-feet have two simple claws, a well-developed pulvillus, and very rudimentary paronychia.



The characteristic patterns and markings of *Neptis* are such that the species are unlikely to be confused with those of any other genus except *Athyma*. If the example be a male, it may be distinguished as *Neptis* from the fact that the hind-wing costal nervure (8) ends on the costa in *Neptis*, whilst in both male and female *Athyma* this nervure ends on the hind margin. If it be a female, *Neptis* may be distinguished by the precostal nervure, which is straight where it arises from the costal, whilst in *Athyma* it follows a continuous curve from its origin; also in *Neptis* the subcostal nervures in the hind-wing arise much nearer to the costal than in *Athyma*. Further, in *Athyma* there is near the origin of the fore-wing median nervure a short spur on the inner marginal side. Such a spur is absent in *Neptis*.

The larvae are but little known. That of *dumetorum* will be described under that species.

The present paper is an attempt to deal with the forms and species of the Ethiopian region, though it cannot claim to be a complete revision, owing to lack of sufficiently long series of many forms. It may be that collectors generally, deceived by the great monotony of pattern and colouring, have neglected the genus in the belief that comparatively small series of specimens were sufficiently representative. It may be that some of the forms are really comparatively rare. In either case the fact remains that many species are but poorly represented in collections, whilst the difficulty of identification has led to numerous errors of nomenclature. So far no serious effort seems to have been made to investigate the relationships of the various described species, though at the same time, considering the fine distinctions and in some cases almost indescribable differences between what are really separate species, the literature of the genus is not wanting in certain shrewd diagnoses of their affinities.

As a problem in taxonomy the genus presents a number of difficulties, some of which in the absence of adequate material still remain unsolved. There are genera of Lepidoptera in which the male armature furnishes good and constant characters, enabling us to confirm or amend conclusions founded on outward and more easily observed features. In other cases we know that these anatomical structures are of so simple a nature that they are of little value in specific diagnosis.

In the African forms of *Neptis* we have in some instances instability of pattern combined with variability of anatomical structure, each condition tending to throw doubt on conclusions based on the other. Some species can be isolated with ease on well-differentiated characters of the male armature. In other cases we have forms very different in outward appearance, but not constantly distinguishable in the anatomical characters. If, for example, we take two forms A and B, of different pattern, and dissect and examine the genitalia, one mounted specimen of each may show recognisable differences. If, however, we take another example of A the armature may present differences from the first specimen of A, such differences being as great as those between B and the original A. Again, we may make preparations from two examples C and D, whose external differences are of the slightest and by no means so great as the outward variations of undoubted forms of the same species, only to find that the respective armatures are so completely distinct that specific identity is out of the question.

Furthermore, there are forms, the external facies of which are so utterly different that we are bound to regard them as well-separated species, but the male armatures are not merely doubtfully distinguishable but of a highly complex form.

The form of the male armature also raises another question. Given several distinct types of structure in these organs, each type being broadly distinguishable from the others, how far are we justified in assuming that the members of the genus referable to one particular type of armature are necessarily more nearly related to each other than to species whose armatures fall under another type—that, in fact, they form an intra-generic group? If we do this with *Neptis* it is true that the majority of forms in groups so constituted seem fairly naturally associated, but at the same time there are instances in which two or more forms of totally different outward facies have armatures which are not constantly distinguishable. Thus *trigonophora* and *kikideli* are apparently widely separated, and yet it would be impossible to decide from a number of preparations which belonged to the former and which to the latter. This is not a question of a very simple structure of the armatures, since the claspers of these two species are of a curious form considerably elaborated and totally unlike those of any other African species.

A far more complicated case is that of the forms which include *ochracea*, *exaleuca*, *woodwardi*, *swynnertoni*, *incongrua*, and other species. At first sight the only difference between *exaleuca* and *ochracea* is that of colour. Grünberg on one occasion referred to an example of *ochracea* as *exaleuca* var. *ochracea*, a terminology I should have been inclined to support in the absence of anatomical preparations. Nevertheless, we find that whilst the claspers in *ochracea* are of fairly constant form, and that a peculiarly specialised one, those of *exaleuca* are extremely variable, though none of the variations resembles the clasper of *ochracea*. Close as is the resemblance between these two species in everything except colour, the clasper of *ochracea*, whilst apparently constantly distinguishable from that of *exaleuca*, is not easily distinguishable from that of *incongrua*, *woodwardi*, *neavei*, and, most remarkable of all, *nemetes*. All these species are totally different in outward appearance from *ochracea* and from each other.

Again, the form described by Lord Rothschild as *neavei* is outwardly almost indistinguishable from the previously described *swynnertoni*, yet the armature of *swynnertoni* approaches that of *exaleuca*, to which species it has no outward resemblance whatever, whilst the claspers of *neavei* resemble those of *ochracea*, with which again there is no outward agreement. Where the structure of the armature is of a particularly simple kind and not subject to any characteristic elaborations no difficulty arises. Where, however, that structure is found to be highly modified, and also of a very distinct character as compared with other forms in the same genus, we should at first sight be tempted to suppose that those species possessing a distinctive type of armature were therefore closely related. But, as we now see, in the genus *Neptis* there are species whose armatures are most closely similar and highly specialised, which, to judge by their outward facies, are very widely separated. At the same time there are forms which appear nearly allied in their outward-characters, but have markedly different genitalia.

Apart from the foregoing examples we have the difficulty of the forms of *nysiades* described more fully under the heading of that species.

Dr. W. J. Holland (Bull. Am. Mus. Nat. Hist., xliii, 6, p. 164, 1920) proposes a new genus, *Neptidomima*, in which he places one species *Neptis exaleuca*. He bases this separation on the structure of the palpi, which he describes as "more robust, porrect, and hirsute" than in any species known to him. It is true that the palpi in this species are densely clothed with flat scales, most of them black. The same, however, applies to the palpi in *woodwardi*, *ochracea*, *incongrua*, and some other species. If we are to take this character as generic, then the other species named must also be included in the new genus. Now, the genital armatures of these forms are of the same character as that of *nemetes*, certainly a true *Neptis*. For reasons stated above I cannot, in this genus at least, attach too much importance to the armature as a test of near affinity; nevertheless, the establishment of a separate genus for *exaleuca* and the other species with similar palpi seems to me unnatural and based on very insufficient characters. As Heron pointed out years ago (see Trans. Ent. Soc., 1911, p. 7), the palpi of *Acraea johnstoni butleri* differ from those of other species of *Acraea*, including all the other forms of *johnstoni* itself. As *butleri* is merely a local form of *johnstoni*, we have here an example in which the difference in the palpi is not even a specific character. It is perhaps not irrelevant to add that the name *Neptidomima* is in any case undesirable, since it suggests a genus whose members mimic *Neptis*. Thus the generic names *Crenidomimas*, *Mimacraea*, *Pseudacraea*, etc., all have a significance which is well understood and supported by considerable evidence, whereas *Neptis exaleuca* and its allies, so far from being mimetic of other species of *Neptis*, are of all the genus the most aberrant in their facies.

In the descriptions it will be noted that several species have a pearly iridescent area on the underside of the h.-w. in the male. Special scales can be observed in this area, and my friend Dr. F. A. Dixey has kindly examined them for me. It would not, however, appear that they are of specific importance.

I have pleasure in acknowledging the kind assistance I have received from Dr. F. A. Dixey, F.R.S., Mr. J. J. Joicey, Dr. K. Jordan, M. Ch. Oberthür, Prof. E. B. Poulton, F.R.S., Mr. N. D. Riley, Lord Rothschild, F.R.S., and Mr. G. Talbot. I should like also to express my appreciation of Mr. Alfred Robinson's admirable photographs, from which the plates of imagines have been printed.

KEY TO THE AFRICAN FORMS OF THE GENUS *NEPTIS*.

(The sexes are alike in pattern.)

Some or all of the discal spots and bands of upperside yellow. *a.*
All paler markings above, white (rarely bluish). *g.*
(*a*) F.-w. cell on underside contains white dots, usually also visible above. *b.*
Cell without white dots. *d.*
(*b*) F.-w. inner marginal spot absent or only faintly developed . . . *comorarum*. (545)

	F.-w. with a well-marked inner-marginal spot, sometimes confluent with spots in 2 and 3.	c.	
(*c*)	Expanse about 50 mm., h.-w. discal band only about 3 mm. wide, distally edentate	*dumetorum.*	(543)
	Expanse about 35 mm., h.-w. discal band about 5 mm. wide, distally regular .	*mayottensis.*	(545)
(*d*)	Discal yellow band broad (4–5 mm.) quite or nearly continuous from inner margin of h.-w. to f.-w. area 3, its proximal margin almost a straight line.	*e.*	
	Yellow band narrower (2–3 mm.) and having a curved proximal outline from inner margin of h.-w. to f.-w. area 3.	*f.*	
(*e*)	F.-w. band continuous from inner margin to area 3	*ochracea.*	(554)
	F.-w. band interrupted by ground-colour in anterior half of 1*b* . .	*ochracea ochreata.*	(554)
(*f*)	H.-w. band nearer to base than to hind-margin, short and pale ochreous .	*woodwardi.*	(553)
	H.-w. band nearer to hind-margin than to base, long and deep yellow . .	*frobenia.*	(542)
(*g*)	Base of h.-w. beneath practically unicolorous with rest of ground-colour (generally red-brown) not striped or spotted.	*h.*	
	Base of h.-w. beneath striped or spotted.	*m.*	
(*h*)	White spots within f.-w. cell.	*i.*	
	No white spots in cell.	*j.*	
(*i*)	On h.-w. underside a small white spot in area 6	*neavei.*	(556)
	No white spot in area 6 . . .	*swynnertoni.**	(556)
(*j*)	Underside ground-colour red-brown or orange-brown.	*k.*	
	Underside ground-colour ochreous .	*exaleuca exaleuca.*	(555)
(*k*)	H.-w. underside without heavily marked dark internervular rays	*incongrua incongrua.*	(552)
	H.-w. underside with heavily marked dark internervular rays.	*l.*	

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* This is the principal difference between typical *neavei* and *swynnertoni*, and it is not a constant one. Nevertheless, the male armatures differ. (See under descriptions.)

(*l*)	F.-w. with three or four minute white dots beyond cell, h.-w. white band about 2 mm. wide	*incongrua occidentalis.*	(553)
	F.-w. without such minute dots, h.-w. band about 5 mm. wide . . .	*exaleuca suffusa.*	(556)
(*m*)	Base of h.-w. beneath irregularly marked and spotted not with regular pale bands on a dark ground.	*n.*	
	Base of h.-w. beneath with curved bands of white or whitish on a dark ground	*r.*	
(*n*)	F.-w. cell nearly all white.	*o.*	
	F.-w. cell dark or only with white dots .	*p.*	
(*o*)	H.-w. discal band only about 3 mm. wide	*metella.*	(548)
	H.-w. discal band about 5 mm. wide .	*metella* f. *gratilla.*	(549)
(*p*)	F.-w. subapical spots in 5 and 6 not separated by ground-colour . .	*nemetes* f. *carpenteri.*	(551)
	F.-w. ditto separated by ground-colour, at least proximally.	*q.*	
(*q*)	H.-w. discal band about 5 mm. wide and not markedly projecting outwards in area 5	*saclava.*	(546)
	H.-w. ditto about 3 mm. wide and with prominent discal projection in area 5	*saclava* f. *marpessa.*	(547)
(*r*)	F.-w. cell dark above like ground-colour, or with only minute white dots, not with sharply defined streaks or spots (*trigonophora* sometimes has a diffused white streak in f.-w. cell above).	*s.*	
	F.-w. cell contains more or less white, at least some part of which is sharply defined.	*h′.*	
(*s*)	F.-w. discal band practically continuous from nervure 2 to, or nearly to, costa (nervule 4 may be rather blacker than the rest, but see footnote on *seeldrayersi*, p. 539).	*t.*	
	F.-w. discal band discontinuous, generally owing to reduction of spot in area 4.	*a′.*	
(*t*)	F.-w. cell on upperside has white dots.	*u.*	
	Ditto rarely with faint paler markings, but not in the form of dots.	*w.*	

(*u*)	F.-w. delicate submarginal lines are continuous, interrupted only by the nervules.	*v.*	
	These lines less distinct between nervules 3 and 4	*agatha.* *jordani.**	(558) (560)
(*v*)	H.-w. discal band extends beyond nervule 6	*seeldrayersi.*†	
	H.-w. ditto does not extend beyond nervule 6	*livingstonei.*	(561)
(*w*)	Proximal edge of f.-w. discal band straight.	*x.*	
	Ditto concave or indented.	*z.*	
(*x*)	F.-w. discal band sharply defined, the nervures only very faintly marked.	*y.*	
	Discal band formed of elongated white spots rounded and deeply indented distally between nervules	*nysiades* (part).	(584)
(*y*)	F.-w. discal band almost pyriform and pointed at costal end. Submarginal lines on both wings markedly white	*nina.*	(580)
	Ditto narrower towards costa, but not pyriform. Submarginal lines not so markedly white	*puella.*	(579)
(*z*)	F.-w. band somewhat indented distally by ground-colour, especially in 3 and 4, band composed of spots of nearly equal length	*nysiades* f. *continuata.*	(584)
	Ditto with the spot in 2 very small and only touching that in 3 at its inner anterior angle	*nysiades* f. *metanira.*	(584)
	Ditto with spots in 4, 5, and 6 considerably longer than those in 2 and 3	*nysiades* f. *conspicua.* *nicomedes* f. *puelloides.*‡	(584) (579)

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* No absolutely constant character can be given to distinguish these two species; *jordani* is smaller than the average size of *agatha*, and the ground-colour is paler. In *jordani* the discal band is more consistently narrowed towards the costa.

† Occasional examples of *seeldrayersi* have the f.-w. band separated into elongated spots by an increased blackening of the nervules. Such examples are distinguished from *nysiades* by the white dots in f.-w. cell above.

‡ *Puelloides* can generally be distinguished from *conspicua* by its smaller size and the interruption of the f.-w. submarginal lines in area 3 and often in 6.

(*a′*)	F.-w. band does not reach costa, only just extending as a narrow longitudinal streak beyond nervule 6 .	*nysiades* f. *clarei.*	(584)
	F.-w. band reaches costa or at least into area 8.	*b′*.	
(*b′*)	F.-w. cell distinctly dotted with white.	*c′*.	
	F.-w. cell dark, though rarely with vestiges of an ill-defined streak.	*e′*.	
(*c′*)	White band of both wings very broad (6–10 mm.) and continuous from h.-w. inner margin to nervule 4 of f.-w. .	*kikideli.*	(569)
	White band not so broad and distinctly interrupted in area 1*b*.	*d′*.	
(*d′*)	The fine line just beyond the discal band is almost straight between the nervules	*rogersi.*	(568)
	This line is well arched (proximally concave) between the nervules, especially in 2, 3, and 4	*barnsi.**	(567)
(*e′*)	On h.-w. underside distal to white band a row of large more or less rounded dark spots on a lighter ground-colour.	*f′*.	
	Without such spots.	*g′*.	
(*f′*)	H.-w. beneath with conspicuous costal white band extending from base to about middle of costa	*poultoni.*	(551)
	H.-w. beneath with such band if visible at all very short and not extending along costa	*nemetes nemetes.*	(549)
(*g′*)	In f.-w. cell beneath is an elongated curved clavate spot followed by two to four very small spots beyond cell .	*trigonophora.*	(570)
	F.-w. beneath with an irregular narrow white mark along costal edge of cell and a transverse streak across end of cell	*nysiades* (part).	(584)
(*h′*)	On h.-w. upperside the innermost of the three white submarginal lines is widened so as to form a conspicuous white band at least 2 mm. wide.	*i′*.	

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* Strand's *nysiades urungensis* appears to come here, but there is no figure of it and the description is not sufficiently detailed to decide on its exact position. It may even turn out to be one of the above two species.

	This line at most only slightly wider than the others, not more than 1 mm.	k'.	
(i')	A narrow but continuous longitudinal white stripe in f.-w. cell, but no transverse stripe	*rothschildi.*	(574)
	A transverse white stripe across end of f.-w. cell.	j'.	
(j')	F.-w. cell with a longitudinal white stripe	*paula.*	(574)
	Ditto with three transverse marks progressively smaller proximally . .	*biafra.*	(571)
(k')	Discal band of f.-w. continuous from area 2 to, or nearly to costa, or only just interrupted by nervule 4.	l'.	
	F.-w. band markedly interrupted at nervule 4.	m'.	
(l')	In f.-w., proximal edge of spots in 2 and 3 forms a straight line at or nearly at right angles to the long axis of spot in 4	*nicomedes quintilla.*	(579)
	This proximal edge is S-shaped without a sharp angle	*nicomedes nicomedes.*	(578)
(m')	White marks in f.-w. cell are transverse and usually three in number. (When very faintly developed = *nysiades* typical)	*nysiades* (part).	(584)
	White stripe in cell longitudinal.	n'.	
(n')	In f.-w. cell a white wedge-shaped mark followed distally by a contiguous triangular patch of greyish white scales	*jamesoni.*	(563)
	Without such greyish patch (rarely with a few grey scales).	o'.	
(o')	Discal spot in area 4 of f.-w. is a mere narrow line touching nervule 5, such line nearly as long as the spot in 5	*nicoteles.*	(576)
	F.-w. discal spot in area 4 not of this form.	p'	
(p')	F.-w. spot in 4 well-developed and at least as long as that in 5 . . .	*strigata.*	(582)
	This spot, if present at all, very small and isolated.	q'.	

(*q′*) The white streak in f.-w. cell is long and narrow and just above the origin of nervule 3 is sharply indented anteriorly but not quite divided by the ground-colour. Beneath, this indentation usually contains a white dot . . . . *nebrodes.* (562)

F.-w. cell streak otherwise formed. *r′*.

(*r′*) F.-w. discal spots in 2 and 3 and in 5, 6, and 7 are not notably separated and so form two conspicuous white patches, very little white in cell . *melicerta* f. *goochi.* (581)

F.-w. discal spots divided by more or less complete invasions of the ground-colour. *s′*.

(*s′*) F.-w. discal spots 5 and 6 very short, almost rounded. Inner marginal spot obsolescent . . . . . *nicobule.* (577)

F.-w. discal spots 5 and 6 elongated, inner marginal spot or spots well developed. *t′*.

(*t′*) White mark in f.-w. cell beneath followed distally by a curved white line parallel with its distal outline . *lermanni.* (564)

Without such line. *u′*.

(*u′*) A well-developed triangular spot just distal to f.-w. cell stripe . . . . *melicerta.* (580)

Without such triangular spot . . { *mixophyes.* (576)
{ *nicodice.** (577)

1. NEPTIS FROBENIA. Pl. XX, fig. 1; Pl. XXIV, fig. 1.

Fabr., Ent. Syst. Suppl., p. 425 (1798); God., Enc. Meth., 9, p. 430 (1823); Boisd., Faune Mad., p. 51 (1833); Trim., Trans. Ent. Soc. Lond., p. 335 (1866); Mab., Hist. Mad. Lep., 1, p. 170, pl. 20, f. 5, 6 (1885–7); Auriv., Rhop. Aeth., p. 166 (1898); in Seitz, Macrolep., p. 199, pl. 48*c* (1913).

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* I can find nothing in the description of *nicodice* to distinguish it from *mixophyes* except its size. The former is said to have an expanse of 48 mm. and the latter 32 mm. Size is of little value in the genus. I have before me examples of *agatha* varying 20 mm. in expanse.

MAURITIUS.

Expanse about 38 mm. Ground-colour uniform umber brown. On f.-w. a narrow hind-marginal border very slightly paler followed inwardly by a second and sometimes a third slightly paler line. On inner margin near angle a small, not always well-defined spot of deep yellow, traversed by nervule 1. In areas 2 and 3 deep yellow spots forming a large ovate discal mark, its long axis nearly at right angles to costa. Three subapical spots of deep yellow forming a rather irregular mark in 5, 6, and 8, the middle spot the largest and that in 8 the smallest. On h.-w. a discal band of deep yellow almost pointed at anal angle, but widened gradually to nervule 4, thence somewhat narrower, and barely reaching the costa, its proximal edge nearly straight, its distal tending to concavities between the nervules. Marginal and submarginal narrow borders somewhat paler than ground-colour.

Underside. Paler and duller ground-colour. In f.-w. a trace of a white line across end of cell. In h.-w. the discal band white or faintly pinkish, sharply defined proximally, but distally shaded into ground-colour and followed by two pale zigzag lines whose angles lie on and between the nervules. In the male there is a silky opalescent area on inner margin of f.-w. extending to nervule 2.

Neptis frobenia is not very common in collections. It is easily identified and has a very different appearance from that of any other species. The male clasper is very like that of *comorarum*. Owing to lack of material I am unable to say whether the small differences shown in the drawing are constantly recognisable. Aurivillius gives Madagascar as a locality for this species, but there appears to be no record of its occurrence on that island.

2. NEPTIS DUMETORUM. Pl. XX, fig. 2; Pl. XXIV, fig. 2.

Boisd., Faune Mad., p. 50, pl. 7, f. 6 (1833); Mab., Hist. Mad. Lep., 1, p. 169, pl. 20, f. 3, 4 (1885–7); Oberth., Etud. d'Ent., 13, p. 14 (1890); Metamorph., Oberth., *l. c.* 12, p. 14, pl. 4, f. 2*c*, 2*d* (1888); Auriv., Rhop. Aeth., p. 166 (1898); Poulton, Proc. Ent. Soc. Lond., p. xxxiii (1908); Auriv., in Seitz, Macrolep., p. 199 (1913).

BOURBON.

Expanse about 45 mm. Ground-colour dark umber. Paler markings deep yellow. F.-w. with three minute white dots in cell and three, sometimes four beyond it. A submarginal border consisting of two lines faintly darker than ground-colour, between which are developed minute white dots especially towards the apex. A small hind-marginal spot of deep yellow followed by a large discal spot in 2 and 3, more quadrate than in *frobenia*. A subapical spot made up of patches of nearly equal length in 5, 6, and 8. H.-w. with traces of a hind-marginal border of lighter and darker markings and with a discal band of deep yellow of sharply defined but irregular outline, not more than about 3 mm. wide at its broadest part, deeply concave between the nervules from 1*b* to 4 and projecting suddenly outwards in area 4.

Underside more or less reproducing the pattern of upperside, but ground-colour much paler and f.-w. hind-marginal and subapical spots nearly white; also a whitish transverse mark across end of cell. Hind-wing base with faint indications of pale spots, a curved row of small whitish spots in 4, 5, 6, and 7, followed by the discal band which is white or pinkish, sharply defined on both edges, and distally edged with dark brown followed by a greyish line. Slight indications of a double submarginal row of pale spots. Male with a pearly opalescent area in f.-w. extending from inner margin beyond nervule 2.

The following description of the larva is from Oberthür.

Originally fed on *Tragia reticulata*, but now feeds on *Acalypha marginata*, plants introduced from Mauritius. Larva pale chestnut. Flexed, about 22 mm. long. Six lateral membranous protuberances; the intermediate ones longer and projecting forward like horns. Three sublateral festoons edged with white and above the angle of the festoon white oblique marks. The last festoon rises posteriorly towards the caudal extremity, which ends in four fine points. Underside rose brown. The last segment has a pale shining mark of "arabesque" form. A paler median dorsal line arises from the prothorax and ends well before the caudal extremity.

The chrysalis is angular, short, flattened laterally, and projecting at the alar extremities. Gold pink tending to yellow or cream, opalescent. All the dorsal projections end in green points with a green iridescence. The prominent abdominal lines are touched with gold. The abdominal segments have a gold reflection.

Alleged occurrences of this species elsewhere than in the island of Bourbon seem unreliable. The male clasper resembles that of *comorarum*, but presents small differences which will be noted in the figure.

3. NEPTIS MAYOTTENSIS. Pl. XX, fig. 3; Pl. XXIV, fig. 3.

Oberth., Etud. d'Ent., 13, p. 14, pl. 2, f. 10*a*, 10*b* (1890); Auriv., Rhop. Aeth., p. 166 (1898); Poulton, Proc. Ent. Soc. Lond., p. xxxv (1908); Auriv., in Seitz, Macrolep., p. 199, pl. 48*c* (1913).

MAYOTTE I.

Expanse about 35 mm. Ground-colour dark umber. F.-w. with three white dots in cell and three beyond. A submarginal border of two very slightly darker lines with paler marks between them which are resolved into distinct white dots towards the apex. A deep yellow inner-marginal patch in 1*a* and 1*b* continuous with the h.-w. discal band. A large patch of deep yellow in 2 and 3, and three subapical spots of same colour in 5, 6, and 8, the last very small. H.-w. with a broad dark yellow discal band 4 mm. wide and of regular outline. A submarginal border of two lines darker than ground-colour, the inner line twice the width of the outer.

Underside. Ground-colour paler. F.-w. large spots only slightly yellow, and the white dots accentuated. There are also two yellowish marks in cell and a transverse one at end of same. Traces of a second submarginal series of white dots beyond those which are also visible above. H.-w. irregularly marked in basal area with ill-defined whitish and yellowish spots, the discal band pinkish white and the space between it and hind margin occupied by a border consisting of internervular patches of dark brown shaded to reddish, each patch bounded proximally by a curved, and distally by a straight whitish line. Between the latter and margin a third very fine white line. The male has a pearly opalescent area in f.-w. reaching to nervule 2.

The female is paler and all the white dots more accentuated on both surfaces, so that on the upperside there is a complete submarginal series of these. In the h.-w. the discal band is broader. The male clasper except for its smaller size is very like that of *dumetorum*.

4. NEPTIS COMORARUM. Pl. XX, fig. 4; Pl. XXIV, fig. 4.

Oberth., Etud. d'Ent., 13, p. 14, pl. 2, f. 9*a*, 9*b* (1890); Auriv., Rhop. Aeth., p. 166 (1898); Poulton, Proc. Ent. Soc. Lond., p. xxxv (1908); Auriv., in Seitz, Macrolep., p. 199, pl. 48*a* (1913).

GRAND COMORO.

comorarum leighi.

Roth., Novit. Zool., p. 341 (1918).

ANJOUAN I.

comorarum comorarum.

Expanse 35–45 mm. On the upperside this species resembles *mayottensis* with the exception that the f.-w. inner-marginal spot is nearly always absent, though out of some twenty-four examples before me, three or four have a slight trace of it.

The underside is also very similar, but in the male the f.-w. opalescent area extends well into area 2, while the space between the discal and subapical spots is reddish brown. There is also more reddish brown on h.-w., especially near costa.

comorarum leighi.

Differs from the type form in being smaller, the orange spots above paler, and the markings below less sharp and distinct.

The male clasper of the type form differs from that of its immediate allies in the greater development of the upper projection.

5. NEPTIS SACLAVA. Pl. XXIV, fig. 5.

Boisd., Faune Mad., p. 49 (1833); Lucas in Chenu, Enc. H. N. Pap., p. 132, f. 248 (1853); Trimen, Rhop. Afr. Austr., p. 148, 338 (1862–66); Mab., Hist. Mad. Lep., 1, p. 173, pl. 20, f. 7, 8 (1885); Auriv., Rhop. Aeth., p. 166 (1898); Poulton, Proc. Ent. Soc. Lond., p. xxxv (1908); Auriv., in Seitz, Macrolep., p. 199, pl. 48*c* (1913).

MADAGASCAR.

saclava marpessa. Pl. XX, fig. 5.

Hopff., Sitzb. Akad. Wiss. Berlin, p. 640 (1855); Peters, Reise Moss. Ins., p. 383, pl. 24, f. 9, 10 (1862); Trimen, S. Afr. Butt., 1, p. 272 (1887); Butl., Proc. Zool. Soc. Lond., p. 65 (1888); Auriv., Rhop. Aeth., p. 167 (1898); Butl., Proc. Zool. Soc. Lond., p. 921 (1900); Roth. & Jord., Novit. Zool., p. 536 (1903); Poulton, Proc. Ent. Soc. Lond., p. xxxv (1908); Rogers, Trans. Ent. Soc. Lond., p. 505 (1908); Neave, Proc. Zool. Soc., p. 33 (1910); Auriv., in

Seitz, *l. c.* (1913); Holl., Bull. Am. Mus. Nat. Hist., p. 160 (1920).

= *nemetes* var. *pasteuri.* Snellen, Tijdschr. Ent., xxv, p. 221 (1882).

AFRICA south of Sahara.

saclava saclava.

Expanse about 45 mm. Ground-colour dark sepia. Three white dots in cell and three or four beyond it. An inner marginal spot in 1*a* and 1*b* which may or may not be contiguous with a large white patch in 2 and 3. In area 4*a* a small distally placed white dot followed anteriorly by three white spots in 5, 6, and 8. These are separated from each other by the ground-colour, especially the first two, and the third on the costa is very small. The hind-marginal border consists of two fine whitish lines and sometimes a third close to the larger white marks, much interrupted at the nervules and broken into small spots. Between these and the large discal spots is a row of darker internervular markings sometimes tipped with white scales proximally. On h.-w. a broad white discal band about 4–5 mm. wide of fairly even outline but slightly, though not very markedly, projecting in area 5. Following the discal band there is a row of rather large more or less rounded dark internervular markings, followed again by two lines of equally dark but much narrower marks.

Underside. The white markings are repeated but in f.-w. the subapical patch is continued right to the costa by the addition of linear marks in areas 9 and 10, and these marks are lemon yellow. The ground-colour is variable and blotchy, reddish in cell and along the nervures, darker above central patch to costa, and at apex and between nervules 3 and 4. Externally adjacent to white markings is a row of dark spots, interrupted in area 5. On h.-w. the base is brownish with irregular pale marks. Distal to the discal band a row of dark internervular spots, proximally edged with white, of which those in 3 and 4 are largest. Beyond these, two rows of transverse internervular dark markings, also edged with white.

Male beneath has a pearly inner marginal area in f.-w. extending to nervule 2. The female also has a similar area, but of much smaller extent and generally hidden in average setting.

saclava marpessa.

This is the mainland form and is generally supposed to be distinguished by its narrower white markings, but I have before me W. African examples with the h.-w. discal band broader than in the majority of those from Madagascar. The most constant difference between the mainland and the island forms is the marked projection in the former of the h.-w. discal band in area 5.

Saclava is unlikely to be confused with any other species except *nemetes*, but in the latter the subapical spots are coalescent, and the h.-w. discal band is continuous with the f.-w. white markings right up to nervule 4 of f.-w., at least on the proximal side. The male clasper of *saclava* is of the same type as in the yellow marked Madagascar species, though its upper projection is less highly developed. All these species are undoubtedly closely related. An interesting discussion by Prof. Poulton on the forms will be found in Proc. Ent. Soc. Lond., p. xxxv, 1908.

6. NEPTIS METELLA. Pl. XX, fig. 6; Pl. XXIV, fig. 6.

Doubl. & Hew., Gen. Di. Lep., p. 272, pl. 35, f. 2 (1850); Holl., Ent. News, 3, pl. 9, f. 3 (1892); Auriv., Rhop. Aeth., p. 166 (1898); Poulton, Proc. Ent. Soc. Lond., p. xl (1908); Auriv., in Seitz, Macrolep., p. 199, pl. 48*c* (1913); Holl., Bull. Am. Mus. Nat. Hist., p. 160 (1920).

S. LEONE to V. NYANZA.

metella gratilla.

Mab., Ann. Ent. Belg., 23 Bull., p. 106 (1880); Hist. Mad. Lep., 1, p. 172, pl. 18*a*, f. 7 (1885–7); Auriv., Rhop. Aeth., p. 166 (1898); in Seitz, Macrolep., p. 200 (1913).

MADAGASCAR.

metella metella.

Expanse about 45 mm. Ground-colour dark sepia. Markings white. In f.-w. cell a long prominent streak pointed at base, widest at cell end, projecting beyond, and again reduced to a point. In a few examples this streak is obsolescent. In most specimens there are two small marks just above outer point of cell streak. A small inner-marginal spot of variable size in 1*a* and 1*b*. Two large discal spots in 2 and 3 notably separated by nervule 3. In 4 two small spots, larger ones in 5 and 6, and a very small one in 8. Just distal to spots in 2 and 3, and 5 and 6, a white transverse line, variable and sometimes obsolescent. A hind-marginal border of two white lines variable and generally interrupted in 3.

H.-w. with a broad white discal band followed by dark internervular markings, followed again by two pale lines variable and sometimes white.

On underside the f.-w. is deep yellow at base and for some distance along the costa, the ground-colour pale sepia brown and the white markings of the upperside are repeated but more distinctly. An irregular row of blackish spots beyond the discal white markings. The submarginal white lines, of which there are three, are thickened, and separated only by dark internervular streaks, though more or less completely interrupted in area 3.

H.-w. base yellowish with black spots. The discal band bordered by small internervular black spots followed by a row of larger rounded ones on a yellowish ground, followed again by two narrow black lines on a pale ground.

The male has an inner-marginal pearly white area on f.-w. extending to nervule 2.

metella gratilla.

The Madagascar form seems only to be distinguished by larger white markings, but examples before me from near Lagos are equally remarkable in this respect.

If the numbers received in general collections are of any proportional value *metella* would seem to be comparatively rare. The species cannot well be mistaken for any other with its combination of white streaked cell and h.-w. base beneath yellowish, spotted with black.

If we assume the structure of the male armature to be of value in estimating affinities, all the foregoing species would be regarded as closely allied members of an intergeneric group. They are more easily recognised by their outward characteristics than by the genitalia, which, though all very distinct from those of the rest of the genus, present but small constant differences *inter se.*

7. NEPTIS NEMETES. Pl. XX, fig. 7.

Hew., Exot. Butt., Neptis, pl. 1, f. 1, 2 (1868); Holl., Ent. News, 3, pl. 9, f. 4 (1892); Karsch, Berl. Ent. Zeit., 38, p. 186 (1893); Auriv., Rhop. Aeth., p. 167 (1898); Neave, Proc. Zool. Soc. Lond., p. 33 (1910); Auriv., in Seitz, Macrolep., p. 200, pl. 48c (1913); Holl., Bull. Am. Mus. Nat. Hist., 160 (1920).

S. LEONE to UGANDA.

nemetes obtusa.

Roth. & Jord., Novit. Zool., p. 536 (1903).

SCHEKO.

nemetes f. *carpenteri*, f. nov. Pl. XXIV, fig. 7.

KAKINDU (W. of V. Nyanza). SEMLIKI VALLEY. UGANDA.

nemetes nemetes.

Expanse 40–45 mm. Sepia black with white markings. F.-w. with a white patch beginning at the inner margin and ending at nervule 4. The four spots constituting this patch are somewhat variable. In some forty examples before me they are always contiguous at least on the proximal side, and their inner edge forms a somewhat concave line continuous with the proximal edge of the h.-w. discal band. The spots in 2 and 3 project distally beyond those in 1*a* and 1*b*. In area 4 there is usually a small spot placed distally, and this is followed by a subapical white patch formed of three contiguous spots in 5, 6, and 9. In many examples there is an irregular, somewhat broken white line about 1·5 mm. from the other white markings and roughly following their outline. Beyond this are two, sometimes three delicate pale lines interrupted at the nervules and in area 3 and at apex. Fringes rather notably white between nervules except in 3 and 6.

H.-w. with a white discal band varying from 3 to 5 mm. in width. Beyond this band a row of rounded internervular spots rather darker than the ground-colour, followed by three pale lines which are in some specimens quite white and distinct. Fringes markedly white between the nervules.

Beneath, ground-colour pale. Costa white at base. In cell a white line running along subcostal nervure and curving over to form a transverse boundary at end of cell. Just beyond this boundary a second fine pale line, and beyond that a third. On median side of cell a short broken line. White patches as on upperside. White lines much more distinct, and irregular dark spots between discal patches and submarginal border lines.

H.-w. base brown with three transverse white lines, the first basal and continuous with subcostal line of f.-w. cell, the second broader and almost continuous with the median line of f.-w. cell, and the third narrow and hardly reaching the costa. Discal white band as above followed by a pale yellowish-brown line on ground-colour and a band of dark well-rounded internervular spots, which are shaded away outwardly, to be followed by a rather broad white line and two narrow ones, all divided by the nervules. Dark spots at nervule ends.

nemetes obtusa.

Messrs. Rothschild and Jordan's description of this form is as follows :—

> Costal margin of f.-w. shorter than in *nemetes nemetes*, the wing appearing more obtuse. The white band in both wings much narrower, the inner edge of the band of the h.-w. crossing vein M just at point of origin of M1. Length of f.-w. 21 mm.

nemetes f. carpenteri.

There is no quite constant difference between the upperside of this form and that of *nemetes nemetes*, though in the latter the f.-w. spots in 2 and 3 tend to be longer. Beneath, the ground-colour and all the light markings, except the large white bands and spots, are more yellowish, thus bringing the dark rounded spots into greater prominence. The principal difference, however, is in the base of h.-w. cell beneath, which is not banded with white, but is of a yellowish ground-colour with more or less well-defined black spots.

There is no recognisable difference between the armatures of the typical form and f. *carpenteri*.

Except for the variability of the width and extent of the white markings *nemetes* is a fairly constant and easily recognised species. The only species likely to be confused with it is *N. poultoni*, which, however, can at once be distinguished by the conspicuous curved white costal band at base of h.-w. beneath. The form *carpenteri* seems to be the only one at Kakindu. Wherever it occurs it appears to be accompanied by *metella*, a fact which suggests a mimetic approach to that species in the pattern of h.-w. base beneath.

8. NEPTIS POULTONI. Pl. XX, fig. 8; Pl. XXV, figs. 7, 8.

Eltr., Ent. Mo. Mag., Ser. 3, vol. vii, p. 26 (1921).

UGANDA (Chagwe, Mabira Forest).

> " Expanse 38-42 mm. Ground-colour dark sepia, with white discal markings. F.-w. with an inner marginal patch in 1*a* and 1*b* the proximal edge of which forms a straight line continuous with that of the h.-w. discal band. In 2 and 3 are large contiguous spots forming a subovate patch of regular outline. In area 4 a minute white dot placed distally. In 5, 6, and 10 contiguous spots forming a large subapical patch. Distal to the white markings and roughly following their contour a line somewhat paler than ground-colour, followed by

a band of more or less rounded dark internervular spots, this followed again by three paler lines forming the hind-marginal border. Fringes dotted white between nervules.

H.-w. with a white discal band of regular outline 4 mm. wide on inner margin, and rather broader in 5, thence narrowing to a small spot in 7. Distal to the white band a border similar to that in f.-w.

Underside. Ground-colour paler than above. Costa white at base and as far as cell end. In cell a white line on subcostal curving downwards and outwards, its end pointing to origin of nervule 3. On end of cell a white transverse line, and beyond this, indications of a second indistinct line. Discal white spots as above, but subapical extends into 10. The border arrangement of pale lines much accentuated owing to increased whiteness of lines and an additional fine marginal line.

H.-w. brown at base, but with a *conspicuous curved white costal bar from base to end of* 8, followed by two indistinct narrow whitish streaks on dark ground. Beyond discal band border of same pattern as in f.-w."

Neptis poultoni closely resembles *nemetes nemetes* Hew. and also, even more closely, *trigonophora* Butl. From *nemetes* it is at once distinguished by the curved white costal band in h.-w. underside, and from *trigonophora* by the underside pattern of the hind margins of both wings. The male armature is unlike that of any other species I have examined. In the note to my original description (*l. c.*) the word "costal" was unfortunately misprinted "distal."

9. NEPTIS INCONGRUA. Pl. XX, fig. 9; Pl. XXIV, fig. 8.

Butl., Proc. Zool. Soc., p. 112, pl. 6, f. 2 (1896); *l. c.* (1896), p. 826 (1897); Auriv., Rhop. Aeth., p. 169 (1898); Auriv., Sjostedt Exp. Kilimandjaro, p. 6 (1910); Auriv., in Seitz, Macrolep., p. 203, pl. 48*f* (1913).

DABIDA HILLS. MOMBASA. KIKUYU. TAITA. NYASSALAND. TANGANYIKA TER. LINDI.

incongrua occidentalis.

Roth., Novit. Zool., p. 342 (1918).

90 km. W. of L. ALBERT EDWARD.

incongrua incongrua.

Expanse about 50 mm. Sepia black with white markings. F.-w. with two small hind-marginal spots in 1*a* and 1*b* separated by the nervure. Two spots in 2 and 3, the upper one the smaller. A subapical row of three spots, the first in 5, rounded, the second in

6, subquadrate, the third in 8, very small. Three small dots beyond cell. (One example in the Hope Dept. has an additional discal spot in area 4.)

H.-w. with a discal band of white spots about 3 mm. wide at broadest part extending from inner margin to area 6, the spots progressively more separated, that in 6 being small and rounded. Fringes of both wings white between nervules.

Underside chestnut brown. F.-w. without spots in cell, but with three small dots beyond it. Spots as on upperside but less separated, the two upper spots of subapical row fused together with an additional streak in 9. In male a pearly inner marginal area extending to nervule 2.

H.-w. with discal band as above, but more continuous and edged with sepia. Extreme margins and all nervures especially in h.-w. black. No internervular rays.

incongrua occidentalis.

Ground-colour greyer than in the type form. All the spots of f.-w. discal band wanting except those on each side of 1, 3, and 6, and these are much smaller. H.-w. band narrower. Both above and below there are dark internervular rays. Beneath the disc of f.-w. and outer fifth of h.-w. much deeper rufous.

Neptis incongrua is quite unlike any other species except *swynnertoni*, from which it differs in having smaller white marks and no spots in f.-w. cell.

I have examined the type of *incongrua occidentalis*, and though the great reduction of the white spots gives it a characteristic appearance, the male armature seems to resemble that of the type form within the limits of individual variation.

10. NEPTIS WOODWARDI. Pl. XX, fig. 10; Pl. XXIV, fig. 9.

Sharpe, Ann. Nat. Hist., (7) III, p. 243 (1899); Poulton, Trans. Ent. Soc., p. 512, pl. xxix, ff. 1, 2, 3, 4 (1908); Auriv., in Seitz, Macrolep., p. 203 (1913).

UGANDA.

Expanse about 45 mm. Sepia brown with yellow and white markings. F.-w. with two spots in 2 and 3 which may be ochre yellow or white, and small subapical spots in 5, 6, and 8, the last very small. These are generally white.

H.-w. with a discal band of ochre yellow 3–4 mm. wide, rarely white, beginning just below nervule 2 and ending in 6. Fringes of both wings white between nervules.

Underside ochreous, brownish over central area in f.-w. and near apex of h.-w. Spots of f.-w. as above, but white and with an additional streak in 9. H.-w. discal band as above, sharply defined. In both wings fine dark internervular rays which are also visible above.

The colour of the lighter markings in this species is extremely variable. In some examples they are all white, but this appears to be due to fading. It is easily distinguished from all other species in so far as pattern is concerned, though the male clasper is doubtfully distinguishable from that of *ochracea*.

As Prof. Poulton has pointed out (*l. c. supra*) examples from E. of the Rift Valley show a greater mimetic approach towards *Amauris*, than specimens from more westward localities. The figures quoted should be referred to on this interesting point.

11. NEPTIS OCHRACEA. Pl. XX, fig. 11; Pl. XXIV, fig. 10.

Neave, Novit. Zool., 11, p. 330, pl. 1, f. 5 (1904); Auriv., in Seitz, Macrolep., p. 203 (1913).

TORO. ENTEBBE. KAKINDU.

ochracea f. *ochreata*.

Gaede, Int. Ent. Zeit. Guben, 9, p. 38 (1915).

= *exaleuca* var. *ochracea*. Grünb., Ergeb. Deut. Cent. Af. Exp. F. von Mecklenberg, 1907–8 (1912).

= *ochracea parvimacula*. Roth., Novit. Zool., p. 341 (1918).

KWIDGWI (L. Kivu).

ochracea f. *milbraedi*.

Gaede, *l. c.*, 9, p. 38, pl. 1, f. 3 (1915).

N. CAMEROON.

ochracea ochracea.

Expanse 40–50 mm. Ground-colour dark to medium sepia brown with orange to pale ochreous areas. F.-w. with a broad patch of ochreous from inner margin to area 3, and a subapical patch of two subquadrate spots of the same colour in 5 and 6, sometimes followed by a small spot near costa. H.-w. with a broad ochreous discal band reaching to origin of 2, its proximal edge forming a continuous but not very regular line with that of the f.-w. inner marginal patch. Nervules and rays dark.

Underside pale dull ochreous, rather darker over basal half of f.-w. Paler marks as above, but h.-w. discal band reaches practically to base and is ill defined distally except in very dark specimens. Nervules and internervular rays well marked.

ochracea f. **ochreata.**

Differs from the type form in having the yellow bands narrower and the f.-w. discal band is interrupted in 1*b*. I have examined an example of the armature of Lord Rothschild's *parvimacula* and it is the same as that of *ochracea.* I cannot discover any difference in outward characters between forms *ochreata* and *parvimacula,* and both are described from the same locality.

f. **milbraedi.**

Differs from the type form in having the yellow bands rather broader and the costal spot wanting in f.-w. This latter point is no real distinction, as otherwise typical forms are without the spot.

The resemblance of *ochracea* to *exaleuca* in all but colour is very remarkable, and it is tempting to regard them as forms of the same species; nevertheless, although the armature of *exaleuca* is variable, I have not found an example approaching agreement with that of *exaleuca.*

12. NEPTIS EXALEUCA. Pl. XX, fig. 12; Pl. XXIV, fig. 11.

Karsch, Berl. Ent. Zeit., 39, p. 9, f. 5 (1894); Auriv., Rhop. Aeth., p. 169 (1898); Auriv., in Seitz, Macrolep., p. 202 (1913); Holl. (*Neptidomima*), Bull. Mus. Am. Nat. Hist., p. 164 (1920).

CAMEROON. CONGO.

exaleuca suffusa.

Roth., Novit. Zool., p. 341 (1918).

95 km. W. of L. ALBERT EDWARD (3250 ft.).

exaleuca f. *integra*, f. nov.

TORO.

exaleuca exaleuca.

Expanse 45–50 mm. Ground-colour dark sepia with white markings. The description of the upperside of *ochracea* applies to this species if we substitute white for ochreous patches, and add that there is a break in the inner-marginal patch in area 1*b*. The pale marks are somewhat smaller than in *ochracea* and distally more sharply defined. Beneath, the ground-colour is pale sepia, but the base of both wings is orange ochreous, and the h.-w. band is very sharply defined, being bounded distally, especially as far as 3, by a fine line darker than the ground-colour.

exaleuca suffusa.

Ground-colour is much darker and the f.-w. patches on each side of 1 and 3 much smaller. The underside is strongly marked with rufous orange.

The male clasper of *exaleuca* is of a very unstable pattern. It differs from that of *ochracea* in the form of the projection on the upperside of the clasper. In *woodwardi*, *ochracea*, and *incongrua* this is extended into a prominent upward and backwardly curved hook. In *exaleuca*, of which I have made several preparations, the hook is very small in one example. In another there is one very small hook on the left clasper and two on the right. In none of my preparations is there any approach to the great development of the hook found in the other species or in *nemetes*. The armature of *exaleuca suffusa* is somewhat intermediate to that of *ochracea* in having a slight development of the upturned hook, but the claspers of *exaleuca suffusa* are not more different from those of *exaleuca exaleuca* than different examples of the latter are from each other.

exaleuca f. integra.

Differs from typical *exaleuca* in having no definite interval of ground-colour between spot in f.-w. 1*a* and that in 2. The male clasper is of the same type as those of the typical form.

13. NEPTIS SWYNNERTONI. Pl. XXI, fig. 1; Pl. XXIV, fig. 12.

Trim., Proc. Ent. Soc. Lond., p. xxviii (1912).

S. E. RHODESIA (Mt. Chirinda).

subsp. *neavei*.

Roth., Novit. Zool., p. 342 (1918).

NYASSALAND (Mt. Mlanje).

swynnertoni swynnertoni.

Expanse 40–50 mm. Ground-colour sepia black, with white markings. F.-w. with three small white spots in cell and four beyond it. A very small inner marginal spot not always extending beyond 1*a*. A large patch of two spots in 2 and 3, its proximal and distal margins forming nearly parallel lines at right angles to the costa. A rounded spot in 5, a subquadrate in 6, and a very small spot in 8.

H.-w. with a discal white band about 5 mm. wide beginning about middle of inner margin and ending, considerably reduced in width, in area 6. All fringes white between nervules.

Underside chestnut brown. White markings as above, but with an extra subapical spot on costa. The h.-w. discal band outlined with darker colour.

The principal distinction between this species and *incongrua* is the presence of white spots in the f.-w. cell, and the large coalescent spots in f.-w. 2 and 3. Whilst the external characters suggest a very close relationship to *incongrua*, the male clasper is so different from that of the other species of the group as to suggest only a very slight affinity. That the clasper of *incongrua* should present a far closer resemblance to that of *nemetes* than to that of *swynnertoni* is a good example of the difficulties presented by this genus.

Trimen (*l. c.*) regards this species together with *incongrua*, *exaleuca*, and *woodwardi* as allied to the Palaearctic species *lucilla* Fab.

swynnertoni neavei.

Whilst the type of this form in Lord Rothschild's collection differs in certain small points from the few examples of *swynnertoni* we have at Oxford, examination of a small series of Mlanje specimens in the national collection shows that such differences are not constant. Perhaps the least inconstant feature is the absence of well-marked internervular rays on the h.-w. underside in *neavei*.

I strongly suspect that when Lord Rothschild described *neavei* he had not seen an example of *swynnertoni*, otherwise he would not have compared it with *exaleuca*, with which it has little in common. Indeed, it is difficult to separate *neavei* from *swynnertoni* on any outward character, but the fact remains that the male armatures are different, at least according to the few preparations I have been able to make from these rare forms.

The clasper of *swynnertoni* is shown at Pl. XXIV, fig. 12. Those of examples from Mlanje (= *neavei*) differ in having an upturned hook at the extremity, somewhat like that of *ochracea*, though less developed. My friend Dr. S. A. Neave tells me that the fauna of Chirinda and Mlanje present great similarities, and the explanation of the present case seems a simple one. The same species, *swynnertoni* has become isolated in the two elevated regions. On Mlanje the clasper has developed an upturned hook. Doubtless in course of time other modifications will arise, and what are now probably forms of the same thing will ultimately become two definitely separate species.

14. NEPTIS AGATHA. Pl. XXI, fig. 2; Pl. XXIV, fig. 13.

Stoll, Cramer Pap. Exot., 4, p. 76, pl. 327, f. A, B (1780); Hopffer, Peters Reise Moss. Ins., p. 383 (1862); Staud., Exot. Schmett., 1, p. 146, pl. 50 (1885–6); Trim., S. Afr. Butt., 1, p. 270 (1887); Karsch, Berl. Ent. Zeit., 38, p. 186 (1893); Auriv., Rhop. Aeth., p. 167 (1898); Roth. & Jord., Novit. Zool., p. 536 (1903); Rogers, Trans. Ent. Soc. Lond., p. 505 (1908); Neave, Proc. Zool. Soc., p. 33 (text fig.) (1910); Auriv., in Seitz, Macrolep., p. 200, pl. 48*d* (1913); Longstaff, Trans. Ent. Soc. Lond., p. 21 (1913); *l. c.* p. 275 (1916); Holl., Bull. Am. Mus. Nat. Hist., p. 160, pl. vi, ff. 7, 8 (1920).

= *melicerta*. Fab., Syst. Ent., p. 508 (1775); Godt., Enc. Meth., 9, p. 432 (1823); Trim., Rhop. Afr. Aust., p. 146 (1862).

= *agathe*. Herbst, Naturs. Schmett., 9, p. 86, pl. 238, f. 7, 8 (1798).

AFRICA S. of Sahara.

agatha ab. *lativittata*.

(*N. lativittata*) Strand, Archiv. f. Naturg., 75, 1, p. 305 (1909).

With type form.

agatha agatha.

Expanse 35–50 mm. Sepia black with white markings. F.-w. with three to four or five dots in cell. A hind-marginal patch of two spots in 1*a* and 1*b*, a discal band of spots from 2 to costa, sometimes quite continuous, sometimes interrupted slightly by nervules, the outer edge forming a fairly regular convex curve, the inner straighter but usually indented at nervule 4. Distal to this band a line rather paler than ground-colour and sometimes bearing a few white scales, this followed by three lines of transverse internervular white streaks interrupted by the nervules and more completely broken (very rarely unbroken) in area 3. Fringes of both wings white between nervules.

H.-w. with a white discal band of variable width, but usually about 5 to 6 mm. extending from middle of inner margin to area 6. Beyond this the ground-colour rather paler, then darker, and finally a submarginal border of three fine white lines, broken only by the nervules.

Underside. Sepia brown. F.-w. white at base of costa, a variable series of spots in cell and two or three beyond it. Discal band as above, but rather broader. The pale line beyond it broader than above, but more diffuse. The white marginal lines much more pronounced, the first expanded into triangular spots near apex. Often a fourth line along hind margin. Interruption in area 3 sometimes complete, sometimes scarcely evident.

H.-w. with a white costal band, followed by two others, the first of which travels well along costa where it is broken into spots. Pale line beyond the discal band often with a slightly ochreous appearance. First (proximal) submarginal line much widened, all more distinct than above, and often a fourth line at margin.

agatha lativittata.

The white markings of more than average extent.

Neptis agatha is by far the commonest and most widely distributed species in the African region. The species with which it is liable to be confused are *jordani*, *livingstonei*, *barnsi*, and *seeldrayersi*. No absolutely constant characters can be given to distinguish *jordani*, but its characteristics so far as they can be described will be found under that species. The form *livingstonei* is unknown to me. The published figure shows the h.-w. discal band extending only to area 5, and this seems to be the principal distinction. The two species *barnsi* and *seeldrayersi* are distinguishable by small features thereunder described. It is unfortunate that the interruption of the f.-w. submarginal lines in area 3 is not an absolutely constant character, some examples referable to the *lativittata* form having practically continuous lines. This condition is, however, rare and the interrupted lines will almost always serve to distinguish *agatha* from the other species named, with the exception of *jordani*, which also has this feature. Holland (*l. c.*) points out that there is generally a difference between examples taken in woodlands and those from more open country, the latter being smaller and having a broader white band.

For the sake of completeness I should mention here a form provisionally named *urungensis* by Strand (Mitt. Zool. Berl. V, p. 287 (1911)), and placed by Aurivillius as a form of *nysiades* (Macrolep., p. 201 (1913)). Strand mentions (*l. c.*) two examples resembling Neave's *conspicua*, one of which is distinguished from typical *conspicua* in having well-defined white dots in cell on upperside. The remainder of the description is quite useless as a means of identification, and the author states that should it prove to be a definite form he proposes the name *urungensis*. In my opinion this kind of half-description and provisional nomenclature should not be valid as founding a name of any kind. If the example in question has distinct white dots in cell it certainly cannot be a form of *conspicua*. I place it here merely because it suggests, though only vaguely, something allied to *agatha*.

15. NEPTIS JORDANI. Pl. XXI, fig. 3; Pl. XXIV, fig. 14.

Neave, Proc. Zool. Soc. Lond., p. 33, pl. 2, f. 1 (and text fig.) (1910); Auriv., in Seitz, Macrolep., p. 200, pl. 48*d* (*agatha* ab.) (1913); (?) Holl., (as *agatha*) Ent. News, pl. 9, f. 2 (1892).

CHISHI I. (L. Banguelo). KATANGA (Kambove). BOUSSA (Kassai R.). ARUWIMI. NYASSA. VICTORIA FALLS.

A detailed description would follow so closely that of *agatha* that it would seem of more use to state as fully as possible the directions in which it differs from that species. I have before me a series of thirty-six examples. In general appearance the ground-colour is browner than *agatha*. The f.-w. discal band is very complete and shows no blackening at the nervules. In practically every case the white spot in area 4 is longer than that in area 5, whereas in *agatha* 4 is generally shorter than 5. In *jordani* the white in 6 is so markedly shorter than that in 5 that the whole band has a narrowed appearance towards the costa, an effect much less apparent in *agatha*. The distal margin of the discal band from nervule 4 to the costa presents on the whole a straight or even concave line, whereas in *agatha* such margin is convex. In h.-w. the white of the discal band projects outwardly between the nervules, especially in 4 and 5, and the ends of such projections are well rounded. In *agatha* the ends of the component white spots are generally cut off nearly straight, and they are not liable to so prominent a projection in 4 and 5. This feature is perhaps even more evident on the underside.

This species was noted in the field by Dr. Neave as being apparently distinct from *agatha*. He states that it was decidedly local, frequenting hot dry localities, and having a more restless, active, and less floating flight.

16. NEPTIS LIVINGSTONEI.

Suffert, Iris, 17, p. 126, pl. 3, f. 10 (1904); Auriv., in Seitz, Macrolep., p. 200 (1913).

E. AFRICA (Lukuledi).

Suffert's description is as follows:—

Length of body 16 mm. Expanse 44 mm. Body blackish above, grey below. Upperside. Ground-colour grey black, markings white. F.-w. discal band formed of six spots in 2–6 and 9, proximally fairly straight and sharply defined from the ground-colour. Distally curved and not well defined. At nervule 4 on both sides an indentation, the nervule very black and slightly dividing the band. An inner marginal spot in 1*a* and 1*b*, 6 mm. wide at margin, rounded anteriorly, rather nearer the margin than the base. Three round dots in cell and two elongated spots at cell end. Four transverse submarginal lines, the first—counting from base outwards—just beyond discal band, very diffuse, formed of obsolescent whitish spots, the second consisting of eight more distinct white streaks broadly interrupted by the ground-colour, the third of eight narrow loosely connected streaks, the last very slender and scarcely recognisable. Fringes black, white between nervules.

H.-w. with a discal band of seven spots in 1*a* to 5; proximal edge well defined, the distal in 1*a* to 2 also well defined, in 3 to 5 suffused. The two first lines very indistinct, rather showing through from beneath, the third narrow, in 1*c* to 6 distally rounded, the outermost also narrow and closely approximated. Fringes black, white between nervules.

Underside. F.-w. ground-colour and markings generally as above, with the exception of the cell which shows seven spots, and four dots in base of 4 to 6 and 10, between cell end and discal band. The four submarginal lines heavier than above.

H.-w. discal band and lines as above, latter more distinct. Three basal bands, the first extending along costa to middle of 8. The second from inner margin to base of nervules 7 and 8 and extending slightly into area 7, the outermost from 1*a* at inner margin through cell a little above base of nervules 5 and 6, into area 5; at end of this band a small spot in the same area.

I have found no example of this form amongst the hundreds of specimens examined. The description and figure suggest a rather aberrant example of *jordani*, though without an examination of the male armature it is impossible certainly to determine its specific identity.

17. NEPTIS NEBRODES. Pl. XXI, fig. 4; Pl. XXIV, fig. 15.

Hew., Ent. Mo. Mag., 10, p. 206 (1874); Holl., Ent. News, 3, pl. 9, f. 1 (1892); Auriv., Rhop. Aeth., p. 169 (1898); in Seitz, Macrolep., p. 202 (1913).

S. LEONE. LAGOS. OGOWE. ANGOLA. CAMEROON.

Expanse 55–60 mm. Sepia brown with white markings. Upperside; f.-w. with an elongated white mark in cell, sharply pointed at base, widest at cell end, and extending into area 4 to within about 1 mm. of the discal spot in 3, where it is narrowed again and comes to a rather indefinite termination. Just above origin of nervule 3 this cell streak has a slight indentation on its costal side. In the majority of examples a minute white spot close to costa near the middle of its length. A small rather elongated inner-marginal patch formed of two spots in 1*a* and 1*b*, followed by two large subquadrate spots in 2 and 3 just separated by nervule 2, and outwardly rather divergent. In 4 a small triangular spot or streak distally placed. In 5, 6, and 9 elongated rather divergent spots, the last very small. Distal to this series of markings a pale line roughly following their contour and interrupted at the nervules. Following this a series of three pale submarginal lines, the first often rather well marked, and all interrupted by the nervules. Fringes of both wings white between nervules.

H.-w. with a well-defined white discal band 5–6 mm. wide, from middle of inner margin to area 6, where it is much narrowed. Close to the distal edge of this band a pale ill-defined line about 1 mm. wide, followed by three pale submarginal lines, the first suffused and about 2 mm. wide, the second very narrow and better defined, the last still narrower.

Underside. Ground-colour rather paler. F.-w. white at base of costa. Cell almost entirely filled with white, and a very small streak at origin of 5 and 6. The indentation in the costal side of the cell mark noted above, here contains a small white dot. Some white scales in base of area 3, several small streaks above cell end. White discal marks as above. Remaining lines much more distinct than on upperside.

H.-w. Base ground-colour with a white costal mark about 4 mm. long, followed by two curved white bands which coalesce near origin of 6. Discal band as above followed by broken whitish line which curls inwards in area 6 and follows costa for some distance. Three submarginal lines as above, but the innermost widened out into a band of large subquadrate spots, the second about 1 mm. wide, and the third very fine, all quite white.

The most distinctive feature of this species is the indentation of the white cell mark, and especially the white dot therein on the underside. Perhaps this character alone is sufficient to distinguish it from other described species.

18. NEPTIS JAMESONI. Pl. XXI, fig. 5; Pl. XXIV, fig. 16.

Godm., Story of the Relief Expedt., p. 436 (1891); Auriv., Ent. Tidskr., 15, p. 283 (1894); Rhop. Aeth., p. 169 (1898); in Seitz, Macrolep., p. 202, pl. 48*f* (1913).

LAGOS. CAMEROON. CONGO REGION.

Expanse 55–65 mm. Sepia black with white and blue-grey markings. F.-w. with a large white mark in cell pointed at base and wide at end of cell, beyond which is a terminal patch of pale blue grey (sometimes separated). The extreme base of the white mark and as far as origin of nervule 2, also blue grey. A large white innermarginal mark consisting of two spots in 1*a* and 1*b*, about 6 mm. long and slightly separated distally. A subtriangular mark in 2 rather distally placed and separated, especially outwardly, from a longer quadrate spot in 3. In 4 a small distal triangular spot, and a subapical series of three elongated spots distally divergent in 5, 6, and 9. Beyond this discal series a delicate line of whitish or blue-grey scales, interrupted at nervules, followed by two similar submarginal lines, the first the more distinct. Fringes of both wings white between the nervules.

H.-w. with white discal band about 6 mm. wide narrowing where it ends in area 6. Near it, distally, a pale line, and beyond it two, sometimes three submarginal lines, the first often distinctly white, the others very narrow and sometimes rather indistinct.

Underside. Ground-colour only little paler than above. F.-w. white at base on costa. Cell with a large pyriform mark cut off rather suddenly at cell end, and immediately followed by a white transverse mark, and a second more or less crescentic spot at base of area 4. Two or three small streaks near costa above end of cell. Other white marks as above but more accentuated. No blue-grey scales. First line beyond discal spots well marked but less pure white than the rest. An additional fine line at margin.

H.-w. with a narrow white costal band from base to rather beyond middle of costa, followed by two white bands the second rather broken and irregular. Discal white band as above followed by a narrow brownish-white line which curves inwards at 6 and travels proximally to join the costal band. The submarginal lines much more distinct than above, the innermost some 2 mm. wide and well-defined.

I have seen but few examples of this species. The blue-grey marks in cell will usually suffice to distinguish it from other forms. It can be distinguished from *nebrodes* by the absence of the anterior notch in f.-w. cell mark, and from *lermanni* by the more elongated divergent f.-w. subapical spots.

19. NEPTIS LERMANNI. Pl. XXI, fig. 6; Pl. XXIV, fig. 17.

Auriv., Öfvers. Vet. Akad. Förhandl., 53, p. 431 (1896); Rhop. Aeth., p. 168, pl. 1, f. 8 (1898); in Seitz, Macrolep., p. 202, pl. 48*f* (1913); Holl., Bull. Am. Mus. Nat. Hist. p. 164 (1920).

CONGO REGION.

Expanse 50–60 mm. Ground-colour dark sepia with white markings. F.-w. with a large white pyriform mark in cell. This mark is generally rather ill defined, not always extending to base, where, however, the ground-colour is generally dusted with blue-grey scales, some of which are also found at the distal end of mark. Beyond this at base of area 4 an ill-defined spot largely composed of pale-grey scales. An inner-marginal patch of two spots in 1*a* and 1*b*, two subovate spots in 2 and 3, separated by nervules, a small triangular spot distally placed in 4, three spots in 5, 6, and 9 slightly separated by nervules and shorter than in *jamesoni*. Following these discal marks a pale line interrupted by the nervules, and three more or less white submarginal lines.

H.-w. with a discal white band about 6 mm. wide from inner margin to area 6, where it is rounded off and narrower. Distal to this a pale line, and three submarginal lines as in f.-w.

Underside little paler than above. F.-w. white at base of costa. Cell mark more fully developed, though tending to an invasion of the ground-colour along basal part of median. Just distal to end of cell mark a curved transverse line followed by a small ill-defined spot, and above this faint traces of small spots near costa. White discal marks as above, that in 4 not more developed than on upperside. Submarginal border lines well developed, and traces of an extra line at margin.

H.-w. with white at base extending as a fine line to middle of costa, followed by a white band incompletely divided into two. Discal band as above followed by a brownish white line which curves round at 6 to meet costal line. Submarginal lines well developed, especially the innermost, which forms a band some 2·5 to 3 mm. wide broken only by the nervules.

Judged both by the pattern and the structure of the male armature *lermanni* is very closely allied to *jamesoni*. From the few examples I have seen the ground-colour is rather browner, and the fore-wing cell mark is without the well-developed distal patch of blue-grey scales. The species is extremely rare in collections.

The six foregoing species all have the male clasper of a form characterised by a single pointed projection (in *jordani* there is an additional inwardly directed point not visible in the figure). The external patterns do not support the view that these species are more closely allied than others of the genus. Indeed, as we shall see, there are other species whose patterns appear to be much more closely allied to that of *agatha*, but of which the male armatures are of a totally different form.

20. NEPTIS SEELDRAYERSI. Pl. XXI, fig. 7; Pl. XXV, figs. 5, 6.

Auriv., Ent. Nachr., 21, p. 379 (1895); Rhop. Aeth., p. 167, pl. 1, f. 7 (1898); Auriv., in Seitz, Macrolep., p. 200, pl. 48*d* (1913); Holl., Bull. Am. Mus. Nat. Hist., p. 161 (1920).

KUMASI to MOMBASA.

Expanse 45–60 mm. Sepia black with white markings. F.-w. with three white spots in cell and from one to five beyond it. An inner-marginal patch formed by two spots in 1*a* and 1*b*, usually coalescent, or at most only divided by the nervule. A discal band of white spots in 2 to 6 and 9. This band may be quite continuous, with the nervules only just visible, or it may be distinctly separated into spots, distally somewhat divergent. The tendency to separation is greatest on nervule 4, but the spot in 4, though it may be narrow, is not appreciably reduced in length (differing in this respect from *rogersi* and *barnsi*). Distal to the discal band and following its contour a pale line well marked or faint, not thrown into distinct arches between the nervules. Three submarginal lines, the first more or less expanded into spots near apex (rarely traces of a fourth near apex). These lines, however faint, are interrupted only by the nervules and never markedly obsolescent in area 3.

H.-w. with a white discal band beginning at inner margin and usually ending in area 6, but sometimes extending into area 7. Its proximal margin forms an almost continuous straight line with the f.-w. inner-marginal patch as far as the median nervure, whence it turns downwards towards the anal angle. This discal band varies in width from 4 to 10 mm. and may be quite continuous, even the nervules being white, or it may consist of spots separated by black nervules, and distally still more so by invasions of the ground-colour. Beyond this band a pale line often only faintly indicated, followed by three, sometimes four submarginal lines. Both wings with white spotted fringes.

Underside. Ground-colour little paler than above. F.-w. white at base of costa. Pattern in cell variable but usually consisting of a white mark on subcostal side with a small proximal and a larger distal posterior projection, between which are two rather faint spots. Following this an irregular line across end of cell. Several small spots above cell end. White discal marks as above, the first line yellowish white, the submarginal lines much accentuated, the most proximal one being widened into subtriangular spots towards apex.

H.-w. with a conspicuous white basal band extending along costa nearly to middle of its length, followed by two rather well-defined white bands. These are much more regular and less broken than in *agatha*. Discal band as above. First pale line well developed and yellowish white. Submarginal lines similar to those on f.-w., the most proximal being expanded into subquadrate spots.

There seems no absolutely constant character by which *seeldrayersi* can certainly be distinguished from *agatha*. The most useful is the continuity of the submarginal lines on the upperside of the f.-w. All examples of *seeldrayersi* seem to be constant in this respect, though rare specimens of *agatha* seem also to have uninterrupted lines. When this occurs in *agatha* it seems to be accompanied by a much paler ground-colour, whereas *seeldrayersi* is nearly always very dark sepia to black. The regularity of the white bands on the base of h.-w. underside is also a useful feature, these in *agatha* being almost always broken and irregular.

N. seeldrayersi is not very rare in collections but is frequently overlooked owing to its resemblance to *agatha*, amongst long series of which a few examples may often be discovered.

21. Neptis barnsi. Pl. XXI, fig. 8; Pl. XXIV, fig. 18.

Eltr., Ent. Mo. Mag., Ser. 3, vol. vii, p. 27 (1921).

CONGO REGION to SEMLIKI VALLEY. KISUMU.

"Expanse 55–60 mm. Ground-colour sepia black with white markings. Five white dots in cell of fore-wing, and traces of two minute dots beyond. An inner-marginal white patch of two elongated spots in 1*a* and 1*b*, their proximal edges straight, outer ends slightly separated. In 2 and 3 two white marks, proximally just separated by nervule 3, but distally more widely divergent. In area 4 an obsolescent white streak (in some co-types well developed). In 5 and 6 elongated spots divided by nervule 6 and distally divergent. A small spot in 9 near costa. Distal to white markings and roughly following their contour a fine line of bluish-grey scales which is thrown into a series of arches between the nervules. Following this, three bluish-grey lines continuous except at the nervules. Fringes spotted white between the nervules.

"Hind-wing with a discal white band about 5 mm. wide, rather narrower at inner margin, slightly projecting proximally at median, and extending to area 6. Distal edge of band indented on nervules by the ground-colour and slightly powdered with black between. Three bluish-grey submarginal lines as on fore-wing, and midway between the innermost of these and the discal band a narrow line somewhat paler than the ground-colour.

"Underside. Ground-colour paler than above. Fore-wing costa white at base and nearly to cell end. In cell a series of rather complicated white markings, consisting of a basal streak terminating in a spot, a transverse streak, two small spots, and two at each cell end. Beyond this, three or four very small spots. Large white marks as on upperside, that in 4 more fully developed, the pale lines all much more accentuated but white, not bluish-grey, and there is a trace of an additional fine line at and below the apex.

"Hind-wing with a large curved white costal band from base nearly to end of 8, followed by two less definite white bands on the brown ground-colour. Discal band as on upperside, and rest as on fore-wing."

This species closely resembles *seeldrayersi* Auriv., from which it may generally be distinguished by the obsolescent character of the streak in fore-wing area 4, and by the fact that the pale line on fore-wing immediately distal to the discal markings is deeply arched (distally convex) between the nervules. The male armature is quite distinct from that of any other described species.

22. Neptis rogersi. Pl. XXI, fig. 9.

Eltr., Ent. Mo. Mag. Ser. 3, vol. vii, p. 29 (1921).

Rabai.

"Expanse about 50 mm. Sepia black with white markings. Fore-wing cell with three or four white dots and three beyond it. An inner-marginal white patch of two spots in 1*a* and 1*b*. Two large subquadrate spots in 2 and 3 separated proximally by the nervule, and distally by a slight invasion of the ground-colour. In 4 a small subtriangular spot, distally placed. Three subapical spots in 5, 6, and 9, the first two subquadrate, distally divergent, and the third a small streak. Just distal to the white discal marks a white line roughly following their contour. This line is not arched between the nervules. Following this, two fine submarginal lines with faint indications of a third, the first breaking into three small but rather conspicuous spots near the costa.

"Hind-wing with a white discal band 7–8 mm. wide, straight, and sharply defined proximally, regular but invaded by the black nervules distally. The outer edge of the band is closely followed by a pale line, and there are three more pale lines forming a marginal border. Fringes white between nervules.

"Underside. Not markedly paler than above. All the lighter markings chalky white. Fore-wing with white at base of costa and a complicated pattern of lines and spots in cell. In the type form there is in the cell a line along the subcostal having two downward projections, between which is a small spot. Just beyond end of this line another spot, and on the median side three spots, one longitudinal and two transverse. Four or five small spots beyond cell. (In the co-type two of the spots coalesce to form a transverse line across cell end.) The spot in 4 is very little larger beneath than above, but more sharply defined and definitely triangular. The discal and submarginal lines are broader and more distinct, only separated by fine dark lines.

"Hind-wing with a curved white costal band, but this much narrower than in *barnsi* and *seeldrayersi*. This followed by two very distinct curved white bands. White discal band very broad and extending from inner margin to area 7. Other lines as on fore-wing."

I hesitate to describe a species from ♀♀ only, but the two examples from which the above account is compiled do not correspond with any other forms in the collections which I have examined. They are at once distinguished from *agatha* and *seeldrayersi* by the small spot in fore-wing area 4, whilst they differ from *barnsi* in the straight formation of the fore-wing discal line bordering on the large white spots. Also in the much narrower hind-wing basal costal band and in the pure white markings of the underside.

23. NEPTIS KIKIDELI. Pl. XXI, fig. 10; Pl. XXV, fig. 1.

Boisd., Faune Mad., p. 50 (1833); Mab., Hist. Mad. Lep., 1, p. 171, pl. 20, ff. 9, 10 (1885–7); Trim., S. Af. Butt., 1, p. 271 (1887); Auriv., Rhop. Aeth., p. 167 (1898); in Seitz, Macrolep., p. 200, pl. 48*d* (1913).

MADAGASCAR.

Expanse 30–57 mm. Sepia black with white markings. In f.-w. three dots in cell and sometimes one to four beyond it. A large discal white patch extending from inner margin to nervule 4 and of variable outline. In area 4 a small spot distally placed, sometimes absent. A subapical patch of three or four spots in 5, 6, and 9 or 5, 6, 8, and 9. Discal and submarginal lines extremely variable and generally obsolescent in areas 3 and 6. Fringes of both wings white between nervules.

H.-w. with a broad white discal band 6–11 mm. wide, the proximal margin of which is continuous with the f.-w. inner-marginal patch. This band extends from inner margin to area 7 or even to costa. Distally it may be of smooth outline or indented at nervules; in the latter case the internervular white marks are well rounded. Discal and marginal lines variable, sometimes scarcely evident.

Underside. Ground-colour rather paler. F.-w. white at base of costa. Cell very irregularly spotted with white, and three or four spots beyond it. White marks as above but larger. The pale discal line little developed or absent. The first submarginal widened into a band of spots conspicuously interrupted in 3 and 6.

H.-w. with a white streak at base of costa extending to end of discal band. Discal band as above. The first marginal line expanded into a row of spots and followed by one and sometimes two narrow lines.

This species may be recognised by the fact that the white markings are continuous from inner margin to nervule 4. Also it is confined to Madagascar, where it is apparently not uncommon.

It is a remarkable fact that the male armature is not constantly distinguishable from that of *trigonophora*, a species to which it bears no close resemblance.

24. NEPTIS TRIGONOPHORA. Pl. XXII, fig. 1; Pl. XXV, fig. 2.

Butler, Ann. Nat. Hist., (5), 2, p. 177 (1878); Auriv., Rhop. Aeth., p. 169 (1898); Butler, Proc. Zool. Soc. Lond., p. 913 (1900) (? *lermanni*); Auriv., in Seitz, Macrolep., p. 201, pl. 48*e* (1913).

E. and S. AFRICA (Rabai to Pondoland).

Expanse 45–50 mm. Sepia black with white markings. F.-w. without white dots, but sometimes with vestiges of a longitudinal streak. An inner-marginal patch in 1*a* and 1*b*, followed by two spots in 2 and 3 slightly separated distally. In 4 a very small spot distally placed, and in 5, 6, and 9 three white spots distally separated, the third very small and streak-like. A pale discal line following the contour of the discal spots. Three delicate but usually well-defined submarginal lines.

H.-w. with a white discal band from inner margin to area 7, straight proximally and very slightly indented distally at nervules. This followed by a pale discal line and three, sometimes four submarginal lines, the innermost of these brownish, the rest extremely fine and scaled with white.

Underside. F.-w. very slightly white at base of costa, a curved clavate white mark in cell, its distal end often bordered by a delicate pale curved transverse line. Beyond this four rather ill-defined spots. White discal marks as above, followed by a well-developed pale line of a yellowish tinge and four white submarginal lines, the first about 1 mm. wide.

H.-w. with a small narrow white streak at base of costa, followed by two curved well-defined white lines. Discal band as above followed by a yellowish line and four submarginal white lines. All fringes white between nervules.

N. trigonophora is not likely to be mistaken for any other species except *strigata*, which, however, has a fully developed spot in area 4, almost invariably a white streak in cell on upperside, and has a large broad white band on h.-w. underside at base of costa. Some forms of the *nysiades* group resemble it, but these have transverse white lines in f.-w. cell beneath. Whilst individual examples of the male armature may show differences from that of *kikideli*, an examination of several preparations convinces me that it would be impossible to decide on the anatomy alone between the two species, if indeed they are really specifically distinct. The case is the more remarkable in that whilst the armatures are so similar they are entirely different from that of any other species examined.

25. NEPTIS BIAFRA. Pl. XXII, fig. 2 (*prox.*).

Ward, Ent. Mo. Mag., 8, p. 121 (1871); Afr. Lep., p. 12, pl. 9, ff. 1, 2 (1874); Auriv., Rhop. Aeth., p. 168 (1898); Auriv., in Seitz, Macrolep., p. 201 (1913); Holl., Bull. Am. Mus. Nat. Hist., pl. 8, f. 3 (1920) (*prox.*); *Non* Holl., Ent. News, pl. 9, f. 10 (1892).

CAMEROON.

Ward's description of this species is as follows:—

> Male. Upperside. Both wings brown black; f.-w. the cell crossed by three diagonal white marks, the outer one the largest, the inner one near the base the smallest; beyond the cell three parallel horizontal white streaks, the upper one the smallest; below midway two clear oval white spots; h.-w. crossed midway by a broad band of white, this band is also continued slightly into the f.-w.; fringe of both wings white; following the outer margin of both wings four white bands, the first from the margin very narrow, second rather broader, third broad especially on the h.-w., fourth narrow and rather undulating on the h.-w.
>
> Underside resembles upperside, with the white markings generally broader. Expanse 2·3 in.

Ward's figure, which is rather rough, agrees with the above description. I have never seen an example exactly like the figure, and certainly there is no specimen in the four great British collections. The most characteristic features are the three white marks in f.-w. cell, in which it differs from *paula*, which has one diagonal and one longitudinal mark, and the secondary white band in the h.-w. Unfortunately the type has been lost, M. Oberthür informing me that it was missing when he acquired Ward's collection. The species, if it be a species, has been much confused with other forms, especially owing to the figure published by Dr. Holland (Ent. News, *supra*). This figure represents a form but little removed from typical *nysiades*. This error was sufficiently confusing, but the same author has only recently (1920, *l.c.*) reasserted that this figure represents Ward's *biafra*. M. Oberthür has kindly sent me a photograph of Ward's figure, and it agrees with the copy we have at Oxford.

The differences between Ward's figure and that of Dr. Holland (Ent. News, 1892) are as follows: —

WARD'S FIGURE.	HOLLAND'S FIGURE.
F.-w. cell with white transverse spot near base followed by a longer transverse mark and a long transverse streak across end of cell.	Three white dots in cell, the outermost rather elongated.
Of the three anterior discal white streaks in f.-w. that nearest costa is very small and faint.	This streak though smaller than the rest is well developed.
Following the discal band of spots is a very distinct though slender white line.	This line obsolescent.
Following the above slender line a well-developed white line formed of spots gradually increasing in size as they approach costa, till that in 6 is quite a large spot 7 × 1·5 mm.	Corresponding line very faint.
H.-w. white discal band about 6 mm. wide.	Ditto about 4 mm.
Following the discal band is a narrow white line arched in 1*a*, 2, 3, and 4 proximally convex.	No such line present.
Distal to above line a band of white spots, their proximal outline well arched (proximally convex). This band is quite 2 mm. wide in 2 and 3.	Only a faint line in this position.

It will thus be seen that whether the insect figured by Holland in 1892 be a form of *biafra* or not, it certainly differs greatly from Ward's own figure of the species.

Dr. Holland, in spite of his emphatic assertions to the contrary, seems to have had some doubt in the matter, since in Bull. Am. Mus. Nat. Hist. pl. 8, 1920, he publishes another figure of "*biafra*" which agrees neither with his own previous illustration nor with that of Ward. It approaches more nearly to the latter in having the secondary white band on the h.-w., though this is much narrower than in Ward's figure. This 1920 figure rather supports the view that *biafra* is yet another form of the polymorphic *nysiades*, since I have before me examples of the latter which are very close to the figure in question.

Since the above was written, M. Ch. Oberthür has most kindly sent me three specimens which it was hoped might elucidate the mystery. One of these agrees so closely with Ward's original figure that I have illustrated it at fig. 2, Pl. XXII. Practically the only difference between it and Ward's specimen is that in the latter the secondary submarginal white band in h.-w. is rather broader than in M. Oberthür's example. The second of M. Oberthür's examples differs in having a still narrower secondary h.-w. band, indeed it is reduced to a mere line, whilst the third example has the h.-w. white markings so reduced that this secondary band is a mere pale suffusion.

Now it is most unfortunate that this third example, least like Ward's species, is the only male, the other two being females: hence the structure of the armature in an example almost exactly like Ward's figure remains unknown. I have made a preparation of the armature in this one male, and it is of a very simple character, somewhat intermediate between that of a form of *nysiades* and *paula*.

Now whilst the two specimens, one male and one female, which are less like true *biafra*, certainly belong to the same species, the female example which comes so close to Ward's figure is probably specifically different. If the figure on Pl. XXII be carefully examined, it will be noted that in f.-w. just beyond the discal white marks there is a distinct but delicate white line (most easily seen in the left wing). This line is deeply arched in 2, 3, and 4. The corresponding line in the other two specimens is scarcely arched at all; indeed, in one of them it is perfectly straight in area 2. Before we can be sure of the true affinities of these forms much more material is necessary. In the meantime it would appear that Ward's *biafra* is probably a good species, and that forms belonging to the *nysiades* association resemble it very closely.

26. NEPTIS PAULA. Pl. XXII, fig. 3; Pl. XXV, fig. 3.

Staud., Iris, 8, p. 368, pl. 8, f. 2 (1896); Auriv., Rhop. Aeth., p. 168 (1898); in Seitz, Macrolep., p. 201, pl. 48*f* (1913).

S. LEONE. LAGOS.

Expanse 40–55 mm. Sepia black with white markings. F.-w. with a subclavate mark in cell followed by a transverse mark, beyond which are three longitudinal stripes in 4, 5, and 6, the first long, the last short and very narrow, and all distally divergent. An inner-marginal patch of two spots in 1*a* and 1*b*, and two discal spots, a larger and a smaller in 2 and 3. These discal marks immediately followed by a delicate white line. Beyond this a line of white spots, transverse and linear in 1*b* to 3, crescentic in 4 and 5, and longitudinal and linear towards costa. Beyond this two fine submarginal lines broken by the nervules.

H.-w. with white discal band from inner margin to 6, about 4 mm. wide followed by a faint pale line. Beyond this a secondary discal band of white subquadrate spots followed by two very fine submarginal lines.

Underside as above, but all white markings more extensive. F.-w. with white at base of costa extending to a point below origin of 2 in f.-w. Traces of an additional fine marginal line in both wings.

N. paula is not rare in collections. The male armature is of so simple a character as to offer little suggestion in regard to affinity. The species has been bred from a pupa found by Lamborn near Lagos. The pupal skin is in the Hope Collection. The hind and inner margins of the wing-cases project so as to form prominent lateral ridges, and on the head there are two bifurcated horn-like projections.

27. NEPTIS ROTHSCHILDI. Pl. XXII, fig. 4; Pl. XXV, fig. 4.

Eltr., Ent. Mo. Mag., Ser. 3, vol. vii, p. 28 (1921).

CONGO REGION (Kassai, Kingour Forest).

"Expanse 50–55 mm. Sepia black with white markings. Forewing with a white cell streak, beginning at base and passing between nervures 4 and 5 to a point considerably beyond the origin of 3. Elongated inner-marginal spots in 1*a* and 1*b*, distinctly separated. Two similar discal spots in 2 and 3 still more separated.

A white dot distally placed in area 4, and a series of three well-separated elongated spots or streaks in 5, 6, and 9. Distal to these discal spots and following their contour a very fine line of greyish-white scales. Beyond this a well-developed white line, broken into spots by the nervules. Finally two delicate submarginal lines.

"Hind-wing with a discal band about 3–4 mm. wide from inner margin to nervule 6, the spots of which are distinctly separated by the nervules. Distal to this a very faint line, rather paler than the ground-colour, followed by a narrow white secondary band of quadrate spots separated by the nervules. Two delicate submarginal lines.

"Underside. Pattern of upperside repeated, but the white marks more pronounced on a paler ground. Fore-wing white on costa at base. Cell streak larger and more sharply outlined. Above end of cell two or three additional white streaks. White submarginal bands much more distinct, especially inner one, which is widened to about 1·5 mm., and there is an extra distal line at apex.

"Hind-wing with a white costal band from base to middle of costa. The secondary discal band composed of spots much larger than above."

This species most nearly resembles *paula* Staud., but is quite differently marked in fore-wing cell above and below. Ward's *biafra* is also similar, but has three transverse white stripes in cell. All three differ from other described species in having a secondary white discal band on the hind-wing. The male clasper of the present species is quite different from that of *paula*.

28. NEPTIS SEXTILLA.

Mab., Le Natural., 2, p. 99 (1882); Hist. Mad. Lep., 1, p. 174 (1887); Auriv., Rhop. Aeth., p. 167 (1898); in Seitz, Macrolep., p. 201 (1913).

MADAGASCAR.

I am unable to give any information with regard to this species beyond Mabille's description. The latter refers to a figure on a plate which appears never to have been published. The author describes it as allied both to *saclava* and *kikideli*. It would seem unnecessary to reprint here the original description, which though lengthy unfortunately gives little idea of the appearance of the insect. Aurivillius in Seitz (*l. c.*) places it next after *paula*, though merely on probability. The type is apparently unknown, and so far no other example has been noted.

29. NEPTIS NICOTELES. Pl. XXII, fig. 5; Pl. XXV, fig. 9.

Hew., Ent. Mo. Mag., 10, p. 206 (1874); Holl., Ent. News, 3, pl. 9, f. 8 (1892); Auriv., Rhop. Aeth., p. 168 (1898); in Seitz, Macrolep., p. 202, pl. 48*e* (1913); Holl., Bull. Am. Mus. Nat. Hist., p. 163 (1920).

S. LEONE to ANGOLA. CAMEROON to MOMBASA.

Expanse 37–42 mm. Ground-colour sepia black with white markings. F.-w. with a white clavate mark nearly filling cell. An inner-marginal patch in 1*a* and 1*b* followed by a more or less rounded patch of two spots in 2 and 3. A subapical patch of white in 4, 5, 6, and 9. In 4 this patch begins only just below nervule 5, so that the spot in that area is a mere streak. The discal marks followed by a pale line, beyond which are three delicate whitish submarginal lines. Fringes white between nervules.

H.-w. with a discal white band from inner margin to area 6 about 5 mm. wide, almost straight on both edges, nervules thereon not or very little blackened. Discal and marginal lines as on f.-w.

Underside. F.-w. just noticeably white at base of costa. H.-w. with a white streak at base of costa followed by two more on the dark ground of basal area. Other marks as above, but white submarginal lines much more accentuated.

This little species is apparently not very common. It may be distinguished from others by the streak of white below and adjacent to nervule 5 in f.-w.

30. NEPTIS MIXOPHYES. Pl. XXII, fig. 7.

Holl., Ent. News, 3, p. 249, pl. 9, f. 11 (1892); Auriv., Rhop. Aeth., p. 169 (1898); in Seitz, Macrolep., p. 202 (1913).

? = *nicodice*. Grünb., Sitzb. Ges. Naturf. Fr. Berl., p. 470 (1910).

BIPINDI. OGOWE.

Expanse 32–42 mm. Sepia black with white markings. F.-w. with white mark in cell, the edges of which are straight and the end pointed. An inner-marginal patch of two spots in 1*a* and 1*b*, followed by two subquadrate marks in 2 and 3, slightly separated. In 4 a small distally placed triangular spot, two separated elongated spots in 5 and 6, and a small mark in 9. Beyond these discal marks a fine white line broken at nervules and bent deeply inwards in 1*b*. Two whitish submarginal lines interrupted only by the nervules, and indications of a third on the margin. All fringes white between nervules.

H.-w. with a white discal band about 5 mm. wide, straight proximally, and outwardly rather indented at nervules. This followed by a pale discal line, and two or three submarginal lines.

Underside. F.-w. as above but white marks more accentuated. No white at base of costa. H.-w. with slender white line on costa at base, followed by two more, the first broad, the second narrow and faint. Beyond the discal band the pale line forms a distinct row of whitish spots, and the first marginal line is widened into conspicuous white spots, the others broader and more distinct than above.

I can find nothing in Grünberg's description of his *nicodice* to distinguish it from *mixophyes*, and there is but little except the continuity of the f.-w. submarginal lines to distinguish either from *nicobule*. However, as this is the principal distinction between *agatha* and *seeldrayersi*, it may be that *nicobule* is a separate species. Lack of material, all three forms being rare, has prevented me from making comparative preparations of the male armature, the only example available and apparently belonging to this species, is a female. The figure on Pl. XXII is really a photograph of Holland's figure. I included this rather than the actual specimen in my possession, since the latter does not agree absolutely with Holland's figure, having an additional spot in f.-w. on costa.

31. NEPTIS NICOBULE. Pl. XXII, fig. 6; Pl. XXV, fig. 10.

Holl., Ent. News, 3, p. 249, pl. 9, f. 7 (1892); Auriv., Rhop. Aeth., p. 168 (1898); in Seitz, Macrolep., p. 202 (1913); Holl., Bull. Am. Mus. Nat. Hist., p. 164 (1920).

S. LEONE to ANGOLA.

A full description of this species would be almost a repetition of that of *mixophyes*, and it will suffice to call attention to the slight differences. In Holland's original figure the f.-w. cell mark is clavate and well rounded distally instead of straight sided and pointed. The discal spots are small and rounded instead of elongated, and the submarginal lines are notably interrupted in 3. From an examination of the rather scanty material at my disposal I am inclined to think that the f.-w. submarginal lines furnish almost the only difference, and without much longer series I am unable to say whether even this is constant.

32. NEPTIS NICOMEDES. Pl. XXII, fig. 8; Pl. XXV, fig. 11.

Hew., Ent. Mo. Mag., 10, p. 205 (1871); Kirby, Handb. Lep., 1, p. 147, pl. 20, f. 3 (1891); Auriv., Rhop. Aeth., p. 168 (1898); in Seitz, Macrolep., p. 201 (1913).

ASHANTI to ANGOLA. UGANDA.

f. *quintilla*. Pl. XXII, fig. 9.

Mab., Ann. Ent. Fr., (6), 10, p. 21, pl. 2, f. 7 (1890); Auriv., Ent. Tidskr., 15, p. 284 (1891) (as *nicomedes*); Rhop. Aeth., p. 168 (1898); in Seitz, Macrolep., p. 201 (1913); Holl., Bull. Am. Mus. Nat. Hist., p. 162 (1920).

LAGOS. IVORY COAST. CAMEROON. ANGOLA. KASSAI. ENTEBBE.

f. *puelloides*, f. nov. Pl. XXII, fig. 10.

LAGOS. GOLD COAST. KAMPALA.

nicomedes nicomedes.

Expanse about 38 mm. Sepia black with white markings. F.-w. with a white mark in cell sometimes clavate extending from near base, widening and curving over downwards and outwards to end of cell, sometimes divided into two, the basal part remaining only as a dot. On inner margin a white mark in 1*a* and 1*b*, the marginal part rather wide and the inner edge forming a continuous straight line with that of h.-w. discal band. A large continuous white discal band from 2 to 9, its outer and inner edges regularly curved, proximally concave, distally convex. Beyond this a pale line, faint or well developed, followed by a narrow white line which is usually expanded into a spot near apex. Two delicate submarginal lines, more or less interrupted in area 3, especially beneath.

H.-w. with a broad discal band about 5 mm. wide, both edges rather straight, and nearly parallel, extending from inner margin to 6, this followed by a pale line and three submarginal lines.

Underside. The clavate mark in f.-w. cell better developed than above, and sometimes with a faint pale transverse line beyond it. Base at costa faintly white. Other marks as above but marginal pattern whiter, and interruption of lines more obvious in 3, and often in 6.

H.-w. with a conspicuous curved white band at base of costa, extending to middle of same, followed by two narrow lines, the lower rather longer than the upper. Other markings as above but marginal lines more developed.

nicomedes quintilla.

Resembles type form, but the spots in f.-w. 2 and 3 are short and quadrate, so that the contour of the inner edge of the discal patch is materially altered. All stages of intermediates occur.

nicomedes puelloides.

F.-w. cell without any trace of white mark, and on underside the white in cell is reduced to a line on subcostal which curves sharply downwards and outwards at cell end. Just beyond this a transverse white line. The spots in f.-w. 2 and 3 vary in length, so that the proximal edge of discal patch may be of the type form or may approach that of *quintilla*. This form bears a close resemblance to *puella*, but may generally be distinguished therefrom by the proximal edge of the f.-w. discal band, which in *nicomedes* is concave or even indented, whilst in *puella* it is straight or even convex. Also in *puella* there is no interruption in the f.-w. submarginal lines. The interruption of the f.-w. lines is the sole distinction apart from the armature between *nicomedes* f. *puelloides* and certain forms which appear to be conspecific with *nysiades* f. *continuata*.

Type Hope Collection, Oxford. Taken by Lamborn at Oni, Lagos, Dec. 1911.

33. NEPTIS PUELLA. Pl. XXII, fig. 11; Pl. XXV, fig. 12.

Auriv., Ent. Tidskr., 15, p. 285, f. 11 (1894); Rhop. Aeth., p. 168 (1898); in Seitz, Macrolep., p. 201 (1913).

CAMEROON. CONGO. UGANDA.

Expanse about 35 mm. Sepia black with white markings. F.-w. without marks in cell. An inner-marginal patch in 1*a* and 1*b*, its inner edge quite or nearly continuous with that of h.-w. discal band. A large continuous discal patch from 2 to 9, the inner edge of which is either straight or convex. This patch not or but little reduced in width till just before reaching costa, where the spot in 9 is very small. The usual discal pale line followed by three fine whitish or bluish-grey submarginal lines, these interrupted only at nervules. Fringes white between nervules.

H.-w. with large discal patch, continuous and with smooth outline followed by discal and submarginal lines as on f.-w.

Underside. F.-w. as above but white markings especially submarginal lines much accentuated. Costa whitish at base. In cell a longitudinal streak on subcostal, followed by a diagonal line across end of cell.

H.-w. with large white curved band on costa from base to a point just above end of proximal edge of discal band, followed by two narrow whitish lines. Otherwise as above with pale lines accentuated, the discal line brownish white.

This species may be distinguished by its small size and by the large continuous discal patch in f.-w. The straight or convex proximal edge of this patch and the uninterrupted submarginal lines distinguish it from *nicomedes puelloides.*

34. Neptis nina. Pl. XXV, fig. 13.

Staud., Iris, 8, p. 369, pl. 8, f. 1 (1896); Auriv., Rhop. Aeth., p. 168 (1898); in Seitz, Macrolep., p. 201 (1913).

E. Africa (Usagara).

Expanse about 30–35 mm. Resembles *puella,* but the f.-w. discal patch is smaller and rapidly narrows from area 4 almost to a point in 6. The discal pale line very faint, but the first submarginal line well developed and expanded into spots towards apex. The submarginal lines interrupted in 3 especially beneath. First submarginal line on h.-w. also formed of distinct white streaks.

I have seen but two examples of this species. Aurivillius regards it as a race of *puella,* but if the structure of the armature is constant then it must be given specific rank. It is easily recognised and not at all like any other form except *puella,* from which it differs as above described.

35. Neptis melicerta. Pl. XXIII, fig. 1; Pl. XXV, fig. 14.

Drury, Ill. Exot. Ins., 2, p. 34, pl. 19, ff. 3, 4 (1773); Herbst, Naturs. Schmett., 9, p. 84, pl. 238, ff. 5, 6 (1798); Staud., Exot. Schmett., 1. p. 147 (1886); Holl., Ent. News, 3, pl. 9, f. 5 (1892); Karsch, Berl. Ent. Zeit., 38, p. 186 (1893); Auriv., Rhop. Aeth., p. 169 (1898); Roth. & Jord., Novit. Zool., p. 537 (1903); Rogers, Trans. Ent. Soc. Lond., p. 505 (1908); Neave, Proc. Zool. Soc., p. 33 (1910); Auriv., in Seitz, Macrolep., p. 202, pl. 48*e* (1913); Holl., Bull. Am. Mus. Nat. Hist., p. 164 (1920).

= *blandina.* Cramer, Pap. Exot., 4, p. 76, pl. 327, ff. E, F (1872).

= *melinoe,* God., Enc. Meth., 9, p. 432 (1823).

S. Leone to Uganda.

subsp. *goochi.* Pl. XXIII, fig. 2.

Trimen. Trans. Ent. Soc. Lond., p. 336 (1879); S. Afr.

Butt., 1, p. 273, pl. 5, f. 6 (1887); Butl., Proc. Zool. Soc., p. 65 (1888); Auriv., Rhop. Aeth., p. 169 (1898); Neave, Proc. Zool. Soc., p. 34 (1910); Auriv., in Seitz, Macrolep., p. 202, pl. 48*f* (*not typical*) (1913).

E. AFRICA to NATAL.

melicerta melicerta.

Expanse 30–55 mm. Sepia black with white markings. F.-w. with a large white mark in cell, wedge shaped, sometimes suffused on subcostal side, cut off rather sharply at distal end, and followed closely by a white triangular mark; this sometimes faint, and rarely joined to cell mark at posterior corner. On inner margin a white streak-like mark in 1*a* with a second smaller one in 1*b*, these generally confluent. In 2 and 3 two elongated white marks, usually separated by broadly blackened nervule. In 4 a small spot distally placed, and in 5, 6, and 9 three elongated spots, the first two generally well separated. Following these discal marks a pale line of variable distinctness beyond which are three delicate marginal lines, they and the white marks on fringes being more or less interrupted in area 3 and often in 6.

H.-w. with a white discal band, proximal edge of which is very straight, and continuous with that of the f.-w. inner-marginal spots. Distal edge moderately straight, but often indented at the nervules. A pale discal line followed by internervular marks rather darker than ground-colour, then another pale line (the first of the marginal series), and finally two delicate but usually well-defined marginal lines.

Underside. F.-w. just perceptibly white at base of costa, other markings as above on a rather paler ground, but pale lines much accentuated. An additional marginal line which with the others is notably interrupted in 3.

H.-w. with a short white curved band at base, followed by two straighter lines on the dark ground. Other markings as above but pale lines more distinct, and an additional one on margin.

melicerta goochi.

This form differs from the type in having the f.-w. discal spots more confluent, and in particular in the obsolescent character of the cell mark. The typical *goochi* is really an intermediate between two more definite forms, the one having all white marks fully developed (= Auriv. fig. *l. c. supra*) and the discal spots confluent, the other having the f.-w. cell mark reduced to a spot at the distal end, and the discal spots only rather more confluent than in the typical form. All kinds of intermediates occur, though the prevalence of the diminished cell-spot form in S. and E. perhaps entitles it to subspecific rank.

Neptis melicerta is very common and easily recognised. The male armature is of a simple structure not particularly constant and but little distinctive. The species has been bred by both Lamborn and Farquharson. Only the pupal skins are preserved. They show, though to a less extent than in that of *paula*, the expansion of the wing-cases, and appear to have only a single horn-like projection on the head.

36. NEPTIS STRIGATA. Pl. XXIII, fig. 3; Pl. XXV, fig. 15.

Auriv., Ent. Tidskr., 15, p. 284, f. 10 (1894); Rhop. Aeth., p. 168 (1898); in Seitz, Macrolep., p. 201, pl. 48*c* (1913); Holl., Bull. Am. Mus. Nat. Hist., p. 163 (1920).

CAMEROON to UGANDA and S. SUDAN.

Expanse 45–50 mm. Rich sepia black with white markings. F.-w. with a white mark in cell, rather variable, but on the whole clavate. When well developed, of curved pyriform outline. A large inner-marginal patch of two spots in 1*a* and 1*b*, the inner edge of which is not usually continuous with that of the h.-w. discal band. Two rather short outwardly rounded spots in 2 and 3, tending to be separated distally, and a subapical patch of four spots in 4, 5, 6 and 9, confluent or but little separated. These followed by a pale line and three submarginal lines, the first of which is developed into a diagonal streak or streaks near the apex. Marginal lines interrupted only by the nervules. Fringes white in internervular spaces.

H.-w. with a white discal band about 6 mm. wide from inner margin to 6, where it is rounded off. Following this a line rather paler than the ground-colour, and three delicate submarginal lines.

Underside. Ground-colour paler, white marks more developed. F.-w. faintly white at base of costa. Clavate mark in cell followed by a pale or white longitiudinal mark, sometimes with traces of diagonal streaks above it near costa. The first submarginal line on both wings developed into a band of spots. Traces of an additional line at apex.

H.-w. with conspicuous basal white band from base of costa to about the middle of its length, followed by two narrow white bands, the second much larger than the first.

N. strigata is easily distinguished on outward characteristics, but its specific distinction is very doubtful, the male armature being quite indistinguishable from that of a peculiar form of *nysiades* which I have dissected. This *nysiades* form nearly resembles Holland's *continuata.*

I have now described at length all the species or forms of *Neptis* which can with moderate certainty be distinguished. There remains a residuum of forms which seem to merge one into another in such a way as to render it impossible to separate them specifically even by the male armature. If we examine a series of preparations of the genitalia taken from these forms, and then arrange our preparations in the order of their resemblance, we shall find a great difference in structure between the first and the last of the series, but no satisfactory distinction between any two or three consecutive examples. Moreover, if we then arrange the specimens themselves we shall find that their patterns do not by any means follow the resemblance of the armatures. Thus, as already stated, the armature of *strigata* is indistinguishable from that of a form very near Holland's *continuata*. Some examples of Neave's *conspicua* have armatures which resemble those of typical *nysiades* sufficiently to warrant us in agreeing with Aurivillius, who regards them as conspecific. But one of Neave's co-types of *conspicua* has an armature of a slightly different pattern, whilst the type of *conspicua* itself has the two claspers of the same individual very different in structure. It is impossible to deal on ordinary taxonomic lines with an assemblage of this kind. It is useless to decide that a given example is the same as Holland's *continuata* because it resembles the published figure of that form. We do not know the structure of the armature in the type. A specimen outwardly indistinguishable from *conspicua* may, as I have shown, possess claspers of a different structure, or, since the armature of the type specimen is asymmetrical, we might have two examples outwardly resembling *conspicua* one of which had claspers like the right one of the type, the other with claspers like the left.

In our classifications we attempt to work in what may be metaphorically termed watertight compartments. Nature, though frequently conniving at our methods, refuses always to be bound by them, and we must, I think, decide more freely to admit the existence of indeterminate forms. We have an outstanding example of this in the many indefinite forms which are comprised under the specific name *Acraea acrita*, as set forth in my monograph of the genus *Acraea* (Trans. Ent. Soc., 1912). I propose therefore to give a description of a typical example of *Neptis nysiades*, to detail also the other named patterns which appear to be associated with it, and finally to give the characteristics of several specimens which, as above explained, I consider must for the present at least be regarded as indeterminate forms of the same species. Such forms come within our definition of a species if we assume that they constitute what Prof. Poulton has termed a syngamic chain (Proc. Ent. Soc., p. cxvi, 1903), in which consecutive links are apparently capable of pairing, although the terminal elements may be too far specialised to admit of intercourse, and this not necessarily in relation to any special geographical distribution. Indeed, in cases of this kind syngamic "complex" would be more expressive than "chain."

37. NEPTIS NYSIADES. Pl. XXIII, fig. 4 (nearly typical); Pl. XXV, figs. 16, 17.

Hew., Exot. Butt., (*Neptis*) pl. 1, ff. 3, 4 (1868); Trimen, S. Af. Butt., 1, p. 271 (1887); Auriv., Ent. Tidskr., 15, p. 285 (1894); Holl., Ent. News, 3, pl. 9, f. 10 (1892) (*prox.*) (as *biafra*); Auriv., Rhop. Aeth., p. 167 (1898); in Seitz, Macrolep., p. 200, pl. 48*e* (*prox.*) (1913).

LAGOS to UGANDA.

f. *metanira*. Pl. XXV, fig. 20.

Holl., Ent. News, 3, p. 249, pl. 9, f. 6 (1892); Auriv., Rhop. Aeth., p. 167 (1898); in Seitz, Macrolep., p. 201 (1913).

CONGO REGION to UGANDA.

f. *continuata*. Pl. XXIII, fig. 8.

Holl., Ent. News, 3, p. 249, pl. 9, f. 9 (1892) (as *biafra continuata*); Auriv., Rhop. Aeth., p. 168 (1898); in Seitz, Macrolep., p. 201 (1913).

CONGO to UGANDA.

f. *clarei*. Pl. XXIII, fig. 6.

Neave, Novit. Zool., 11, p. 330. pl. 1, f. 15 (1904); Auriv., in Seitz, Macrolep., p. 201 (1913).

NYANGORI.

f. *conspicua*. Pl. XXIII, fig. 7; Pl. XXV, figs. 18, 19.

Neave, Novit. Zool., 11, p. 329, pl. 1, f. 15 (1904); Proc.

Zool. Soc., p. 34 (1910); Auriv., in Seitz, Macrolep., p. 201 (1913).

TOGO to UGANDA.

nysiades nysiades.

Examples precisely agreeing with Hewitson's type are rare. In it there is a small streak and a dot in f.-w. cell, an inner-marginal patch of which the proximal edge is continuous with that of the h.-w. discal band. Two short separated subquadrate spots in 2 and 3, and a subapical series of four in 4, 5, 6, and 9, slightly separated by the nervules, followed by the usual pale discal and submarginal lines, the latter not interrupted in area 3.

Beneath the f.-w. has a basal streak followed by two diagonal streaks, and the h.-w. has a white costal mark at base, followed by two less distinct whitish lines. All pale discal and submarginal lines more distinct than above. Expanse about 40–50 mm.

From this typical form we pass to a modification of much more frequent occurrence (Pl. XXIII, fig. 5) very closely resembling the figure in Seitz quoted above, pl. 48*e*. This form may be recognised by the much larger discal spots in f.-w., especially the subapical series which are very long (about 8 mm. in area 4) and distally divergent. The pale lines often well marked and white, the first of the submarginal series developed into spots towards apex. The f.-w. cell marks are characteristic, consisting of a spot near base, followed by a short and then a longer diagonal stripe. On the underside the first two marks are joined to form a subcostal line having a small projection about the middle of its length and bent sharply downwards and outwards at its end. This followed by a well-marked diagonal stripe at cell end. This form is very like *strigata* except for the different arrangement of cell marks. (Though for the present I have kept *strigata* separate it is probably only another form of *nysiades*.)

The form *clarei* differs in having the subapical series of f.-w. spots ending in a faint streak just beyond nervule 6 on upperside, thus leaving a rather conspicuous area of ground-colour between the subapical series and the costa. The subapical spots are but little separated, and the inner marginal patch is basally prolonged, so that its proximal edge is not continuous with that of the h.-w. discal band. There are no white marks in f.-w. cell above.

From this we pass through intermediate forms in which the f.-w. spots become less and less separated to the type of f. *conspicua*, in which the discal spots are all joined and form a continuous patch from area 2 to 9. In the type the spots in 2 and 3 are proximally shorter than in 4, so that the inner edge of the patch is sharply angulated on nervule 4. (Very small examples of the *conspicua* form are extremely like *nicomedes puelloides*, but can be distinguished by the continuity of the f.-w. lines in area 3.)

It is in *conspicua* that we begin to get great instability in the form of the male armature. That of the type is asymmetrical, whilst in examples outwardly agreeing more or less closely with the type we find various degrees of shortening and broadening of the claspers with irregular modification of the small projection at the end of that organ. From forms of this pattern we pass to examples in which there is a shortening of the spots in 4, 5, and 6 so that the discal band presents a more evenly curved proximal outline. At the same time the spots become more or less separated by increased blackening of the nervules, the h.-w. discal band is also somewhat narrowed, and we have the form *continuata* of Holland. A slight further reduction of the white markings, especially the spot in f.-w. 2, produces Holland's *metanira*, which seems hardly worth a separate name.

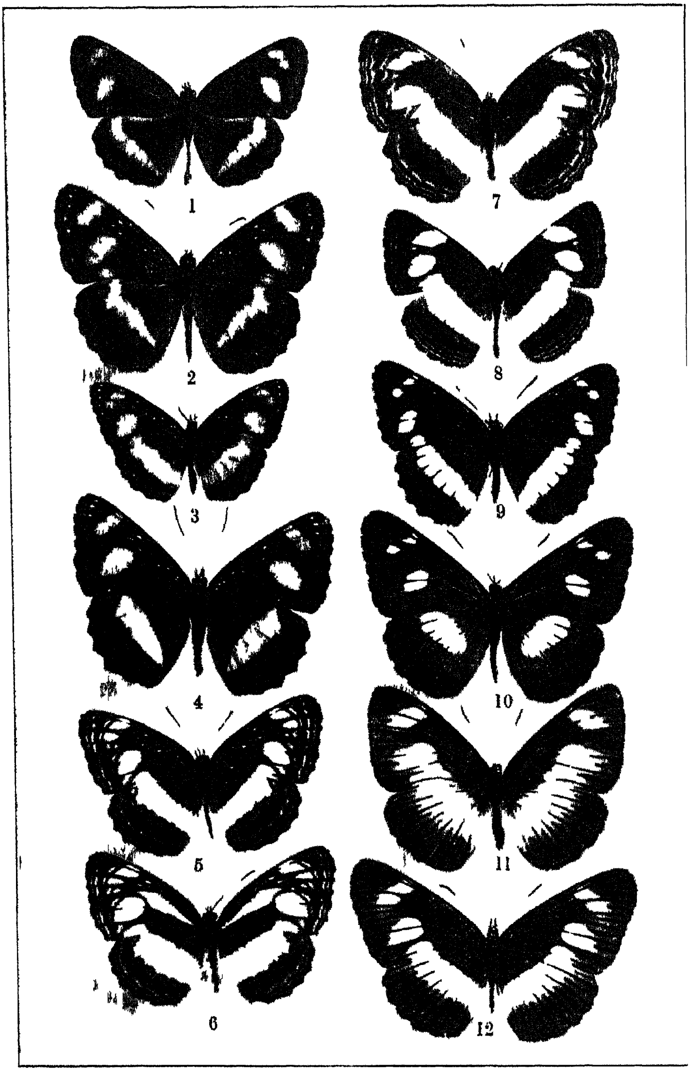
I have before me several examples from the neighbourhood of the Kassai River, the property of my friend Mr. J. J. Joicey. These have an expanse of about 50 mm. Many of them are indistinguishable from forms of *seeldrayersi* except for the absence of white dots in f.-w. cell above, and the streaked instead of spotted pattern in that area beneath. I have figured one on Pl. XXIII, fig. 9.

Other examples from the same neighbourhood are smaller (35–40 mm.), and have all the f.-w. discal spots in 2 and 3 fairly long, rounded at both ends, and about equally separated from each other and from that in 4.

Lastly there is a form from Cameroon, Congo, Uganda, etc., which resembles *conspicua* except that there is a notable interval of the ground-colour between the spot in 3 and that in 4. Pl. XXIII, fig. 10.

I refrain from naming these forms since they are not peculiar to definite localities, whilst numerous intermediates occur in long series. The male armatures are as variable as the patterns, and the whole assembly must for the present be regarded as an unstable species possibly modified by intrageneric mimicry of the kind so elaborately

Trans Ent Soc Lond, 1921, Plate XX.



A Robinson, Photo *Vaus & Crampton Ltd*

FORMS OF NEPTIS.

illustrated by the multiple forms of *Heliconius melpomene*. For those who wish to arrange their collections as correctly as possible, I can only suggest that any form which does not present the distinctive characteristics of one of the better-defined species and of which the male armature is variable and not well characterised should be referred to *nysiades*, until longer series from many localities may perhaps enable us to revise these forms in a more systematic manner.

38. NEPTIS LUGUBRIS.

Rebel, Ann. des K. K. Naturhist. Hofmus. Wien., p. 241, pl. 18, f. 4 (1914).

Since the above paper went to press I have discovered the description of this species. It is accompanied by a very poor photograph, from which it is impossible to derive much information as to affinity. It resembles a small example of *agatha* with much reduced white discal bands, and is described as having no white dot in f.-w. cell above or beneath. The state of the f.-w. submarginal lines is not described, but from the photograph they would appear to be continuous. The locality is given as Lake Tanganyika. Only one example was received.

EXPLANATION OF PLATE XX.

FIG. 1. *Neptis frobenia* Fab. ♂, Mauritius, Coll. Hew. (London).
2. ,, *dumetorum* Boisd. ♀, Reunion (Oxford).
3. ,, *mayottensis* Oberth. ♂, Mayotte I. (Oxford).
4. ,, *comorarum* Oberth. ♀, Grand Comoro (Oxford).
5. ,, *saclava marpessa* Hopff. ♀, Taveta (Oxford).
6. ,, *metella* Doubl. ♀, Lagos (Oxford).
7. ,, *nemetes nemetes* Hew. ♂, Lagos (Oxford).
8. ,, *poultoni* Eltr. ♂ (Type), Chagwe, Uganda (London).
9. ,, *incongrua incongrua* Butl. ♀, Dabida Hills (Oxford).
10. ,, *woodwardi* Sharpe ♀, Kenia (Oxford).
11. ,, *ochracea ochracea* Neave ♀, Chagwe, Uganda (Oxford).
12. ,, *exaleuca exaleuca* Karsch ♂, Bitje, Cameroon (London).

EXPLANATION OF PLATE XXI.

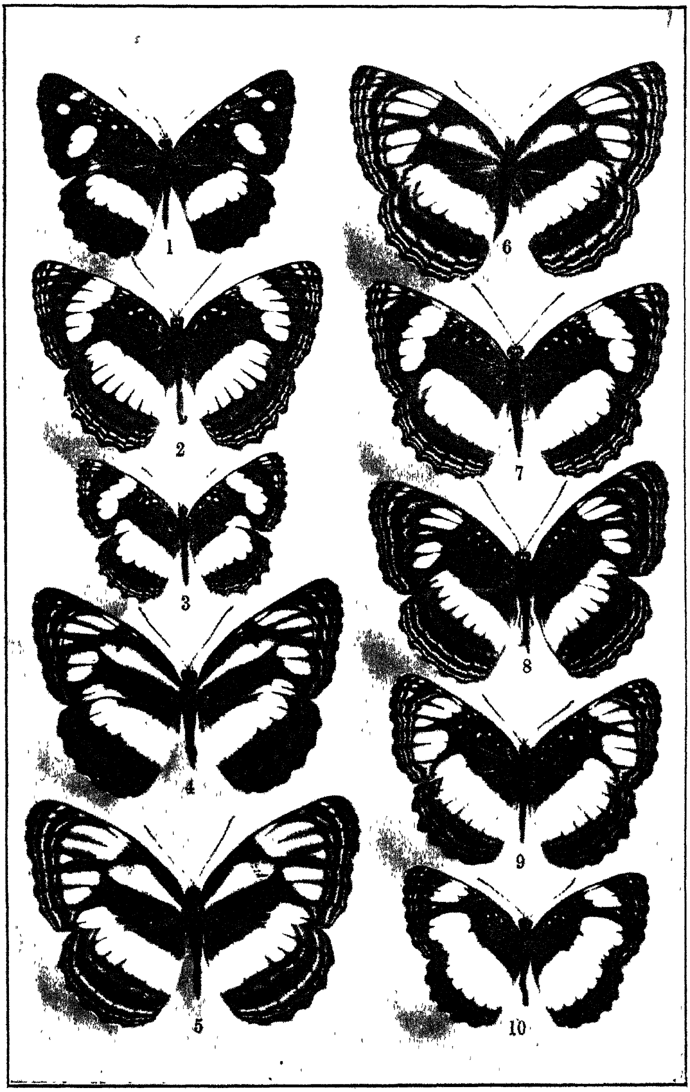
Fig. 1. *Neptis swynnertoni* Trim. ♀, Melsetter (Oxford).
2. ,, *agatha* Stoll ♀, Machakos (Oxford).
3. ,, *jordani* Neave ♀, L. Bangueolo (Oxford).
4. ,, *nebrodes* Hew. ♀, Lagos (Oxford).
5. ,, *jamesoni* Godm. ♀, Lagos (Oxford).
6. ,, *lermanni* Auriv. ♀, Kassai River (Oxford).
7. ,, *seeldrayersi* Auriv. ♀, L. Tanganyika (Oxford).
8. ,, *barnsi* Eltr. ♂ (Type), Belg. Congo (Coll. Joicey).
9. ,, *rogersi* Eltr. ♀ (Type), Mombasa (Oxford).
10. ,, *kikideli* Boisd. ♀, Ambinanindrano (Oxford).

EXPLANATION OF PLATE XXII.

Fig. 1. *Neptis trigonophora* Butl. ♂, Mombasa (Oxford).
2. ,, *biafra* Ward ♀, Cameroon (Coll. Oberthür). This example agrees very nearly with Ward's original figure.
3. ,, *paula* Staud. ♀, Lagos (Oxford).
4. ,, *rothschildi* Eltr. ♂ (Type), Manyema (Tring).
5. ,, *nicoteles* Hew. ♂, Semliki Valley (Oxford).
6. ,, *nicobule* Holl. ♂, Lagos (Oxford).
7. ,, *mixophyes* Holl. (copied from Holland's figure).
8. ,, *nicomedes nicomedes* Hew. ♂, Entebbe (Oxford).
9. ,, ,, *quintilla* Mab. ♀, Entebbe (Oxford).
10. ,, ,, *puelloides* Eltr. ♂ (Type), Lagos (Oxford).
11. ,, *puella* Auriv. ♀, Entebbe (Oxford).

EXPLANATION OF PLATE XXIII.

Fig. 1. *Neptis melicerta melicerta* Dru. ♂, Unyoro (Oxford).
2. ,, ,, *goochi* Trim. ♂, Durban (Oxford).
3. ,, *strigata* Auriv. ♂, Entebbe (Oxford).
4. ,, *nysiades* Hew. ♂, Bitje (Coll. Joicey). An example very near Hewitson's original figure.
5. ,, ,, ♀, Lagos (Oxford). A form much commoner than the type.
6. ,, ,, f. *clarei* Neave ♂, Entebbe (Oxford).
7. ,, ,, f. *conspicua* Neave ♂, Addah, W. Africa (Coll. Joicey).
8. ,, ,, f. *continuata* Holl. ♂, Cameroon (Coll. Joicey).
9. ,, ,, f. (see p. 586) ♂, Kassai R. (Tring).
10. ,, ,, f. (see p. 586) ♂, Chagwe (Oxford).



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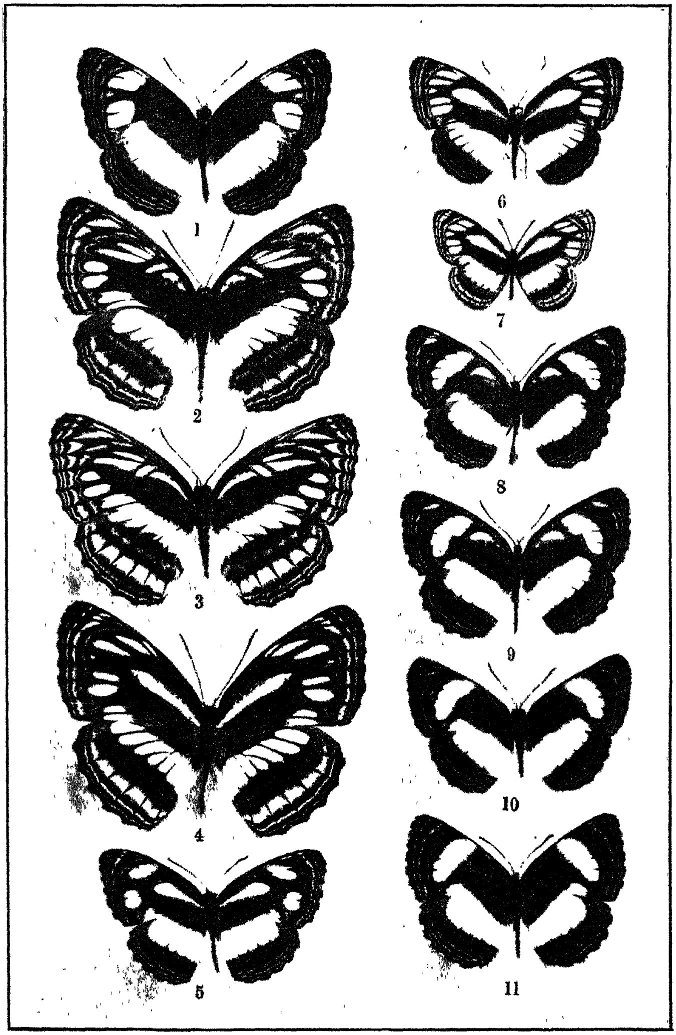
FORMS OF NEPTIS.

Trans. Ent. Soc. Lond., 1921, *Plate XXII.*



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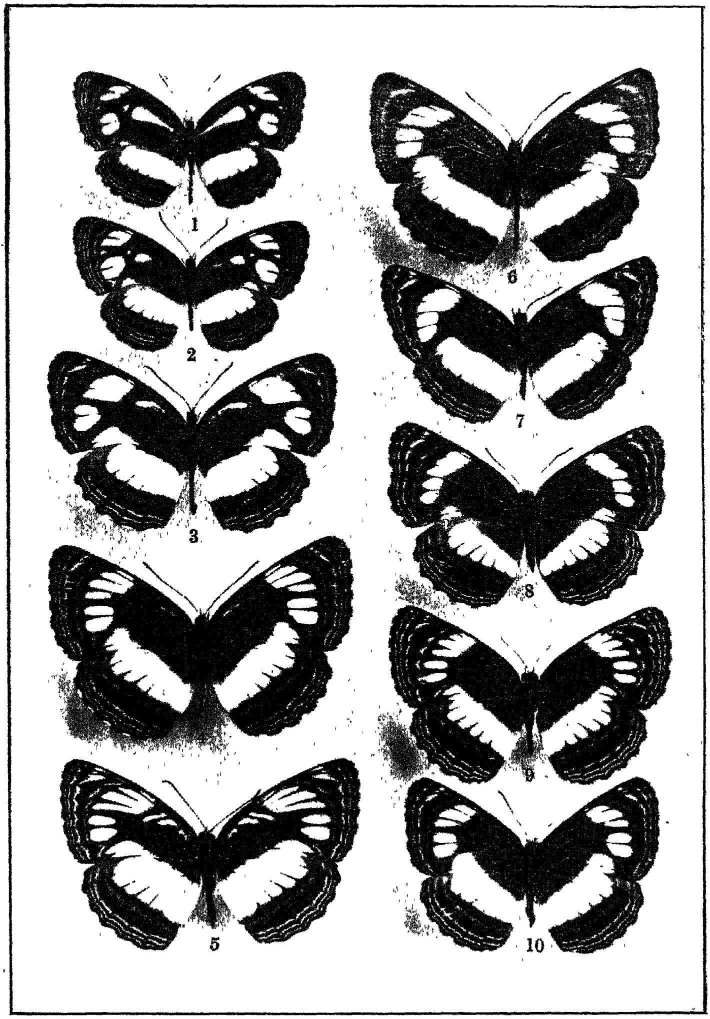
FORMS OF NEPTIS.



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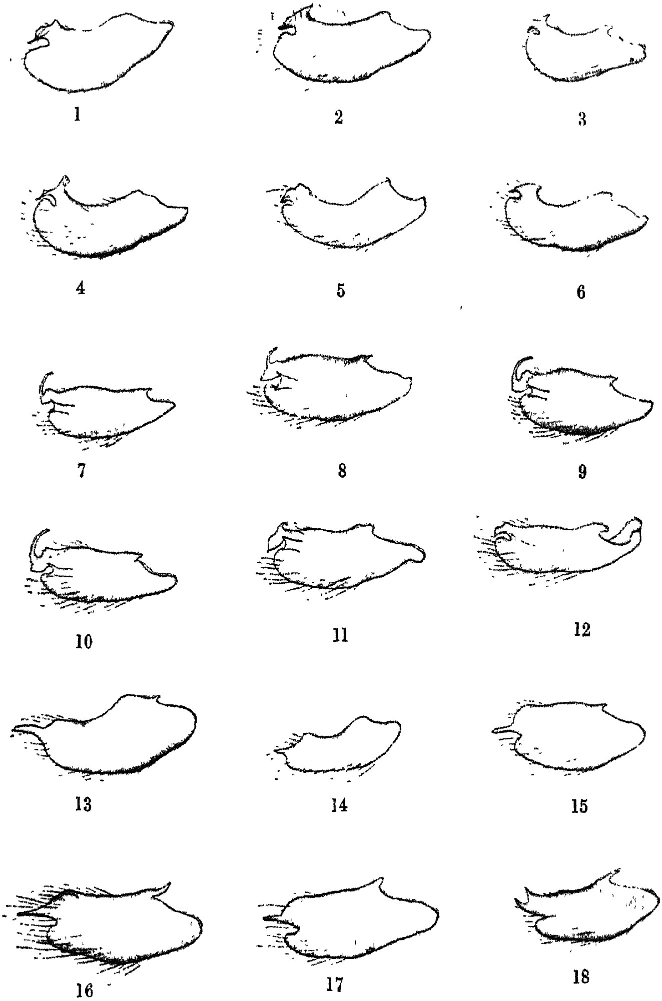
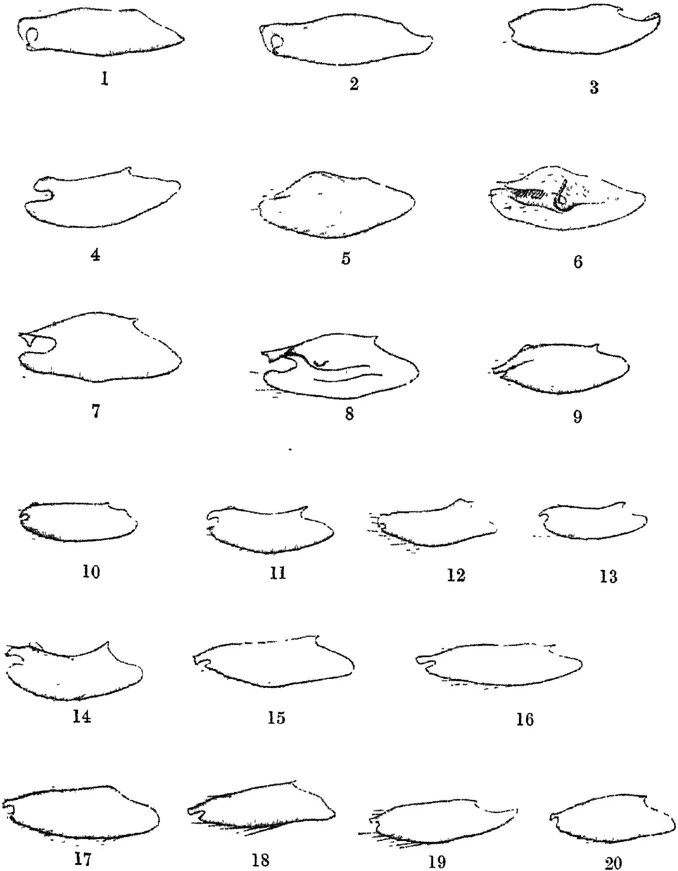
FORMS OF NEPTIS.



H. Eltringham, del. *Vaus & Crampton, Ltd.*

GENITAL ARMATURES OF NEPTIS.



H. Eltringham, del. *Vaus & Crampton, Ltd.*

GENITAL ARMATURES OF NEPTIS.

Explanation of Plate XXIV.

Male Claspers of Forms of *Neptis*.

Fig. 1. *frobenia.*
2. *dumetorum.*
3. *mayottensis.*
4. *comorarum.*
5. *saclava.*
6. *metella.*
7. *nemetes* (f. *carpenteri*).
8. *incongrua.*
9. *woodwardi.*
10. *ochracea.*
11. *exaleuca.*
12. *swynnertoni.*
13. *agatha.*
14. *jordani.*
15. *nebrodes.*
16. *jamesoni.*
17. *lermanni.*
18. *barnsi.*

Explanation of Plate XXV.

Male Claspers of Forms of *Neptis*.

Fig. 1. *kikideli.*
2. *trigonophora.*
3. *paula.*
4. *rothschildi.*
5. *seeldrayersi* (external).
6. „ (internal).
7. *poultoni* (external).
8. „ (internal).
9. *nicoteles.*
10. *nicobule.*
11. *nicomedes.*
12. *puella.*
13. *nina.*
14. *melicerta.*
15. *strigata.*
16. *nysiades* (nearly typical).
17. „ (another example of the same).
18. „ f. *conspicua* (left clasper of the type).
19. „ „ (a co-type).
20. „ f. near *metanira.*

7

XV. *On new or little-known forms of* Acraea. By H. ELTRINGHAM, M.A., F.Z.S.; *with description of a new form of* Acraea encedon, by PROF. E. B. POULTON, F.R.S.

[Read June 4th, 1913.]

Acraea orestia f. *carpenteri.*

= *orestia* f. *humilis*, Eltr., Trans. Ent. Soc., p. 305, 1912 (nec *humilis*, Sharpe).

The description of this form is the same as that given by me (*l. c. sup.*).

I am indebted to my friend Mr. N. D. Riley of the Natural History Museum for calling my attention to the fact that true *A. humilis* differs in certain important respects from the form of *orestia* which so closely resembles it. The acquisition of long series of examples of both these forms from the Mabira Forest, Uganda, has re-established the specific identity of *A. humilis*, and has once more emphasised the difficulty of correctly diagnosing specific distinctions in the absence of ample series of specimens.

The long series referred to above were found by Mr. Riley to consist of individuals which varied from nearly scaleless forms, through a series of intermediates representing the form I have described as *transita* (*l. c.*) up to the usual red hind-winged *orestia*. Further, the nearly scaleless examples are divisible into two groups, one having the sixth and seventh nervures of the hind-wing arising from a common stalk, whilst in the other these nervures arise independently from the cell in the usual manner. I have now examined the genitalia of the form in which the nervures arise from a stalk, and find that their structure differs from that in the unstalked form. It only remained to re-examine the type of *humilis*, when it was found that it exhibited the stalked condition of the nervures. Though described as a female it is actually a male. Both sexes occur in the above series, but there is no marked difference in external characteristics. *Acraea humilis* must therefore be restored to its position as a separate species, and a new name given to the form of *orestia* which so closely resembles it. For this I propose the name *A. orestia* f. *carpenteri*, since Dr. G. D. H. Carpenter actually showed, by breeding, the specific identity of this form with *A. orestia.* Whether I noticed the stalked condition of the hind-wing nervules when examining the type of *A. humilis* I do not now recall, though if so, I probably attached little importance to it in the absence of a series showing it to be constant, since the feature is quite inconstant in some species of *Acraea*, notably in *A. burni* Butl. On the other hand, it is constant in the very few examples of *A. iturina* which I have been able to examine, and this fact naturally suggests some connection between *humilis* and that species. The genitalia are, however, quite different, so that there is no reason to suppose that they are even allied. It seems scarcely possible at present to decide on the position of this species (*A. humilis*). Most examples have a spot in hind-wing near the base of the cell and sometimes there is a second immediately below this in 1*c*. Beyond these there are no markings, the wings being for the most part transparent with a slight dusting of brownish-black scales about the costa of fore-wing and hind-margin, inner margin and base of hind-wing. The genital armature has a very short uncus somewhat like that in *A. penelope*, whilst the claspers are rather like those of *A. buschbecki.*

The synonymy of the species will now be as follows :—

Acraea humilis, E. M. B. Sharpe, Ann. Nat. Hist., (6) 19, p. 582 (1897); Auriv., Rhop. Aeth., p. 86 (1898); Smith & Kirby, Rhop. Exot., 7, p. 23, pl. 7, f. 3 (*non* f. 1 and 2) (1901).

= *orestia* f. *humilis*, Eltr., Trans. Ent. Soc., p. 305 (1912) (part).

Acraea orestia, Hew., Ent. Mo. Mag., 11, p. 131 (1874); Exot. Butt., *Acraea*, pl. 7, f. 47 (1875); Snellen, Tijdschr. v. Ent., 25, p. 217 (1882); Auriv., Ent. Tidskr, 14, p. 273 (1893); Rhop. Aeth., p. 112 (1898); Lathy, Trans. Ent. Soc., p. 186 (1903); Eltr., Trans. Ent. Soc., p. 305, pl. 15, f. 10 (as *humilis*) (1912).

= *orestina*, Plötz, Stett. Ent. Zeit., 41, p. 190 (1880).
= *iturina*, Neave, Novit. Zool., xi, p. 346 (1904).

f. *transita*, Eltr., Trans. Ent. Soc., p. 306 (1912).

= *humilis* ♂, Smith & Kirby, Rhop. Exot., *Acraea*, 7, p. 23, pl. 7, f. 1, 2 (1901).

f. *carpenteri* nom. nov.
= *orestia* f. *humilis*, Eltr., Trans. Ent. Soc., p. 305 (1912) (part).

Mr. Riley has recently called my attention to several examples of a form of *Acraea doubledayi* which shows marked differences from the typical form of that species.

Acraea doubledayi f. *rileyi.*

♂. Expanse about 52 mm. F.-w. less pointed at apex and less concave along hind-margin than in typical *doubledayi.* Ground-colour pale dusky pink dusted with brown at base, spots smaller and markings generally paler.

H.-w. dull pink with markings as in *doubledayi* but fainter, and hind-marginal border narrower.

Underside resembles that of *doubledayi* but the spots are smaller

♀ resembles ♂.

Toma, Abyssinia. Mus. Brit.

The genitalia of this form are similar to those of typical *A. doubledayi.*

I append herewith Prof. Poulton's description of a new form of *A. encedon.*

A. encedon f. *commixta*, Poulton, f. n.

The pattern of this form is made up of the hind-wing of *alcippina* combined with the fore-wing of *infuscata* in which the subapical bar is not white, but tawny or smoky-brown. The fore-wing thus approaches that of *daira,* but differs in the retention of the black apex.

Commixta occurred several times (although to a variable extent) among Mr. Lamborn's captures and bred families, and its pattern is strongly hereditary. *Commixta* resembles *albinus*, Lanz, itself a rather rare combination of two forms of *Danaida chrysippus, alcippus* and *dorippus.* In spite of the resemblance the two forms are not related as mimic and model. It is, in fact, probable that they do not meet. *Albinus* is most often met with in N.E. Africa, while *commixta* has up to the present time been observed only in collections from the West Coast, although there can be little doubt that it exists in Uganda and probably occasionally on the East Coast.

Type in Hope Department, Oxford.

In the Brit. Mus. Coll. there are 2 ♂♂, 2 ♀♀ from S. Leone, 3 ♂♂ from Nigeria, and 1 ♀ from Old Calabar.

I append notes on certain forms of *Acraea* omitted from my monograph, or described since its publication.

Acraea polychroma, Rebel, Ann. d. K. K. Naturhist, Hofmus, Wien, p. 410, pl. 14, f. 3 (1910).

There seems nothing in the figure or description of this form to distinguish it from *A. amicitiae*, Heron. The locality is, however, different, viz. N.W. shore of L. Tanganyika, 2,000 m.

We must, I think, regard *polychroma* as a synonym of *amicitiae*.

A. pullula, Grünberg, Deut. Zent. Af. Exp., p. 516, pl. 11, f. 7 (1911).

As the publication referred to is difficult to obtain, I give herewith a translation of Grünberg's description.

Allied to *A. vinidia*, Hew. Colouring as in var. *tenella*, Rogenh. The yellow markings of less extent, the wings shorter and more broadly rounded.

♂. Upperside, ground-colour blackish-brown, distal half of fore-wing uniformly dark, without pale subapical band. Inner marginal spot of fore-wing on middle of margin 5.5 mm. in width, of the same width in area 1*b*, extending over the basal part of area 2, obscured in the cell and barely indicated in the angle of area 3.

H.-w. very like that of *vinidia* var. *tenella*, the yellow basal part somewhat less developed, the blackish-brown border broader, with small, barely indicated reddish-yellow marginal spots. The black basal spots not perceptible on the upperside. Underside more heavily and extensively darkened than in *vinidia*. Both wings with acute angled yellow marginal spots, subapical band in fore-wing merely vestigial, hind-marginal patch much as on upperside. The pale basal area of h.-w. very much reduced by the black markings, the black basal spots of the costa and cell fused together, beyond the cell large and very black, the distal ones extended into long streaks. The yellowish-red markings distinct only in area 1*c*. On the costa before the precostal nervure a well-defined yellowish-red spot.

Expanse 33 mm.

Ruanda, Mohasi Lake, vii.'07. 1 ♂.

The figure accompanying the description is a very poor one, but I should be much surprised if this form is not ultimately found to be a mere aberration of *A. acerata*.

The fusion of black spots into streaks is an almost certain characteristic of aberration, added to which we have the well-known extreme variability of *A. acerata*.

Acraea (*acerata*) *vinidia*, f. *ruandae*, Grünberg, *l. c.*, p. 516, pl. 11, f. 6 (1911).

This form is described as bearing the same relation to f. *diavina* as does f. *tenella* to the type. The description is as follows :—

Upperside very like that of *tenella*. Pale markings straw-yellow with faint reddish-yellow suffusion. H.-w. with small indistinct yellow marginal spots. Subapical band of f.-w. as large as in *tenella*, the pale mark before the end of cell separated from inner marginal spot. Discal spot in area 1*b* and 2 large and well defined, but somewhat smaller than in *diavina*. Underside also very like that of *tenella*. Discal spot of 1*b* and 2 smaller than above. Black basal and discal spots of h.-w. small, the red streaks scarcely indicated. Length of f.-w. 19 mm.

Ruanda, Mohasi Lake, vii. '07 1 ♀.

A. tropicalis, Blachier, Bull. Soc. Lep. Genève, p. 174, pl. 15, f. 2 (1912).

Ngomo, Fr. Congo.

This is a form of *A. pelopeia* having somewhat less than the normal suffusion on the nervules on the underside of hind-wing.

A. conradti ab. *flavescens*, Blachier, *l. c.*, p 175, pl. 15, f. 3 (1912).

German E. Africa.

The usual red ground-colour is replaced by pale ochreous.

A. horta ab. *conjuncta*, Blachier, *l. c.*, p. 176, pl. 15, f. 4 (1912).

Ground-colour dull brownish-yellow. Hind-wing markings elongated and confluent. No locality.

A. eugenia f. *ochreata*, Grünberg, S. Ges. Nat. Fr. Berlin, p. 470 (1910).

Described as differing from typical *eugenia* in being more densely scaled. The fore-wing with a distinct black discocellular spot. Hind-wing from base to middle scaled with yellowish-brown.

Spanish Guinea, Makomo, Ntume Region. 1 ♂.

Acraea egina ♀ f. *alba*, f. nov.

Grünberg has already * remarked on the ♀♀ of *A. egina* from Sesse I. Examples received at Oxford from Dr. Carpenter exhibit the same peculiarities, and it seems desirable that the form should have a name. On the upperside there is no trace of red or ochreous. The ground-colour is dark sepia grey to black. There is a white subapical bar in fore-wing and the outer half of cell, the space just beyond end of cell, base of area 2, and central part of area 1*b* are dusky white. In the hind-wing the internervular spaces and often the central part of cell are also powdered with dusky white. On the underside there is no red except in area 9, base of 7, base of cell, and of areas 1*c*, 1*b* and 1*a*.

There are in the Oxford collection one or two very similar examples from near Mombasa, but these are associated with ♂♂ of the *areca* form, whereas the ♂ *egina* in Sesse I. is of the typical or western pattern.

The close resemblance of this form to the rare western form *medea* is very remarkable.

Sesse I. Type, Oxford.

Acraea terpsichore f. *ventura*, Hew. (note).

Grünberg has also noted (*l. c.*) that examples of *A. terpsichore* from Sesse I. have the red patches on the hind-wing underside exceptionally well marked. Dr. Carpenter's specimens also show this feature, and all belong to the *ventura* form though differing in the fact that the subapical patch of ground-colour in fore-wing is rarely completely cut off by the discal black bar. The brilliance of the red on the hind-wing underside is in most examples very noticeable, and the inner edge of the marginal border is also frequently dusted with red. The form is scarcely sufficiently well defined to require a name.

One ♂ example differs from all the others in having the marginal and subapical black of the fore-wing and the marginal black of the hind-wing considerably extended, so that the spots of ground-colour are much reduced and the fore-wing subapical patch is very small. In this example the underside of hind-wing has the basal portion dull red, the discal area dusted with red and the inner edge of the hind-marginal border of the same colour. The hind-marginal border is without the characteristic black internervular triangular markings.

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* Sitzb. d. Ges. Naturf. Fr., (4) p. 148, 1910.

A. egina, ab. *contraria*, Grünberg, Soc. Ent. Steglitz, p. 145 (1910).

Described by Grünberg from three male examples from Lake Kiwu.

The form resembles *A. egina* f. *harrisoni*, Sharpe, but the black spots of the hind-wing are much smaller, and on the hind-wing underside the hind-marginal black is much reduced.

A similar example occurs in the Oxford collection and was taken by Neave on Chirui Island, L. Bangweolo.

XI. *On Certain Forms of the Genus* Acraea. *A reply to M. Ch. Oberthür.* By H. ELTRINGHAM, M.A., D.Sc., F.Z.S.

[Read June 7th, 1916.]

PLATE LXXIV.

IN M. Charles Oberthür's Études de Lépidoptérologie Comparée," Fasc. xi, 1916, appears a study of Madagascan Lepidoptera, largely dealing with species of the genus *Acraea.* M. Oberthür states that after reading with great pleasure my monograph of the African species of the genus *Acraea* he has been moved to endeavour to complete some of the details and dispute some of my conclusions.

I would say at the outset that any criticism of my work is welcomed by no one more than by myself. M. Oberthür (p. 133, l.c.) says, "Un même sentiment nous anime, M. le Professeur Houlbert et moi même; la recherche de la vérité." All true scientific workers are animated by this sentiment, and if I feel it necessary to criticise to some extent Professor Houlbert's conclusions, he will, I am sure, consider my remarks in the same friendly spirit in which they are made, and as our countries are allied in the suppression of a barbarous race, so, in a more peaceful sphere, our scientists are allied in the search after truth.

First, then, as to the structure of the male armature in *Acraea,* Professor Houlbert suggests that in this genus occur the most complicated organs to be found in the Lepidoptera. The point is not of great importance, but I would ask him to examine, merely as a relaxation, the armatures of, say, *Hypolimnas monteironis*, some of the *Lycaenidae,* and Plate I in "The Genitalia of the *Noctuidae*" (F. N. Pierce, Liverpool, 1909).

Professor Houlbert next questions my contention that Mabille's effort to classify the genus *Acraea* on the structure of the armature is of little value. I stated at the time that Mabille's view seemed "based on an inadequate study of these structures." I see no reason to modify that statement now, and would only add that had Professor Houlbert made some five hundred carefully mounted preparations of *Acraea* genitalia, as I had to do for my monograph of the genus, he would, I am sure, agree entirely with my statement.

At this point Professor Houlbert makes a curious error in quoting my words. In referring to Schatz and Röber's efforts to classify the species of *Acraea*, I stated that the "characters given are for the most part inconstant." These words Professor Houlbert makes to be my criticism of Mabille instead of Schatz and Röber. It is true I said almost the same thing of Mabille's characters. The words are: "the impossibility of these groups is evident from the instability of the characters suggested." My meaning here was, however, slightly different. Mabille named one of his groups *Aphanopeltis*, and his characteristic for this group was that the ventral plate of the male armature was a structure of variable form. It did not seem to me that variability, or as I said, instability, could be regarded as a suitable characteristic on which to found a subgenus. Moreover, the features Mabille selected for his classification are not features of a comparable kind, since in some species they do not occur at all. Finally, his attempt suffers from the great objection that it utilises a purely sexual characteristic as a feature on which to base a classification.

Now, whether applying to Mabille or to Schatz and Röber, Professor Houlbert objects to my words "the characters given are for the most part inconstant," and says, "mais. ou trouve-t-on des charactères constants?" Naturally I agree with him that characters are not constant in the absolute sense of the word. Were they so the whole majestic scheme of evolution would be an impossibility. Nevertheless, there are characters which are relatively sufficiently constant to enable us to use them as a basis for classification, and when I spoke of the inconstancy of Schatz and Röber's characters I indicated that they were devoid even of that relative constancy which was necessary if they were to be of any taxonomic value. I have nothing but admiration for the descriptions and excellent drawings of the armatures of *A. igati* and *A. damii*. As a study in the anatomy of these insects they are admirable. In a footnote on p. 145 Professor Houlbert says, "Mr. H. Eltringham, l.c. p. 7, a donné de ces organes, deux petites schémas trop simplifiés (fig. 11 et 12) qui ne peuvent fournir qu'une idée très imparfaite de l'armature génitale des *Acraea.*" I agree entirely that my "two little diagrams" "can only furnish a very imperfect idea of the genital armature in *Acraea.*" They were not made with any such comprehensive purpose in view, but merely to illustrate the most essential differences between the two species *igati* and *damii.* My monograph runs to some 375 pages and over 250 illustrations. To have dealt with the detailed structure of the armatures of the 140 species of *Acraea* would have required another volume of similar dimensions, and would scarcely have served an advantageous purpose.

The second part of Professor Houlbert's interesting contribution deals with the sphragis, or seal, found on the female of most species of *Acraea* after pairing. That this structure is of great interest, and its function somewhat obscure, I certainly agree, but I cannot think that Professor Houlbert has thrown much light on the subject by declaring, as he does, that the sphragis is not the result of a secretion deposited by the male on the abdomen of the female. It is true that the process of formation has not, so far as I am aware, been actually observed in the case of an *Acraea.* A homologous formation occurs, however, in at least seven other genera of butterflies, and in the case of *Parnassius* the process of formation has been investigated by Mr. Arthur Thomson, and the subject is dealt with at some length by Mr. H. J. Elwes in his paper on *Parnassius* in Proc. Zool. Soc. Lond., p. 6 *et seq.*, 1886. In my monograph I referred to this article, but did not give extracts from it, thinking that the investigations mentioned were sufficiently well known. I would refer Professor Houlbert, and others who may be interested, to this paper. He will there see that the "pouch" is produced during copulation, and that there is exuded from the abdomen of the male a gelatinous substance which hardens rapidly on exposure to the air, and retains in its hardened condition impressions made upon it whilst in the viscous state. The sphragis in *Acraea* being a formation homologous with that in *Parnassius*, there is every reason to suppose that its origin is of the same nature. On p. 8 of my monograph I pointed out that Marshall had observed no less than three female Acraeas in which the sphragis had been duplicated, though both formations were more or less distorted in shape, "indicating that the second pairing must have taken place immediately after the first, and whilst the first secretion was in a more or less viscous condition." That it is only produced by pairing is certain, since bred females, of which we have hundreds of examples at Oxford, *never* show the structure in question. In face of this fact it is difficult to understand why Professor Houlbert should have written, "Quant à l'origine même du sphragis nous n'avons pas en ce moment, de données assez précises; mais nous ne désespérons pas de l'expliquer le jour òu il nous sera permis de suivre l'évolution de quelques Acraea vivants. Dans tous les cas, nous ne pouvons pas accepter l'opinion des auteurs qui considèrent le sphragis comme le résultat d'une secrétion déposée par le mâle sur l'abdomen de la femelle au moment de l'accouplement."

Professor Houlbert expresses the opinion that the sphragis, owing to its perfect adaptation to the shape of the male armature, ensures the precise and unerring action of those complicated organs. It seems not to have occurred to him that the exact correspondence in shape between the sphragis and the male armature is due to the same cause which governs the correspondence between the plaster cast and its mould: the one has taken its shape through intimate contact with the other.

Two further points remain. Professor Houlbert on p. 152 expresses the opinion that the sphragis is an organ of adaptation, and that after pairing it falls off, and the female genital plate being thus uncovered, the eggs can be deposited, without hindrance, on the plants which are to sustain the larvae.

Now, in the first place, the sphragis does not fall off under normal conditions. It is found on the parent Acraeas in the Hope collections at Oxford, from which were bred long series of examples. Secondly, there is no necessity for its removal, since the external opening of the oviduct is not the same as the copulatory opening, but occupies a posterior position. The insect would be in no way inconvenienced in the matter if the copulatory orifice were hermetically sealed for the rest of its life after pairing. This fact of butterfly anatomy has doubtless escaped Professor Houlbert's notice. The remaining point with which I must deal is the statement on p. 158 that the uncus of the male is more highly developed in those species whose females are found to bear a sphragis, and is very small in cases where the genital plate is reduced or absent. In very many of the smaller Acraeas the sphragis is not or scarcely at all developed, yet in these the uncus is, in proportion to the claspers, very large and well developed.

In one or two places Professor Houlbert suggests that he has had some difficulty in making out the structure of the genital armatures owing to their desiccated condition. Should he continue his investigations, and I sincerely hope he will do so, he will find that if the terminal segments of the abdomen are boiled in caustic potash (KHO) for a minute or two all extraneous matter is easily removed, and the specimen can be dehydrated, cleared in clove oil, and mounted in Canada balsam in a cell so that it is not compressed. He will then find that the organ can be examined under the most favourable conditions, and its form easily made out with the help of the stereoscopic microscope.

If he will submit a sphragis to the same treatment he will find that it disintegrates and dissolves with great rapidity, conclusive evidence that it is of an entirely different chemical constitution from that of the organs to which he would seek to ally it.

Following on this discussion of the armature and sphragis generally, M. Oberthür contributes interesting details concerning some of the less-known Madagascar Acraeas. He points out an error in my account of *Acraea igati*, which I stated to occur only in Madagascar, whereas he has examples from Anjouan and Grand Comoro. I was, of course, unaware of this when my paper was published. *A. damii* and *A. fornax* are dealt with, and finally the author gives a comparative study of *A. strattipocles*, *A. masamba*, and a form to which he gives specific rank, *A. siliana*. M. Oberthür's discussion of these forms is a most useful addition to our knowledge. With characteristic generosity the eminent French naturalist has presented to the Hope Collection at Oxford beautiful series of several Madagascar species of *Acraea*. Amongst these are a number of examples labelled *masamba* and some labelled *silia*. M. Oberthür now finds that the latter do not in reality correspond to Mabille's var. *silia*, but are in fact an undescribed form which he regards as a good species, and for which he proposes the name *siliana*. Furthermore, he declares his inability to distinguish the species of *Acraea* to which Mabille's Pl. 9, fig. 1, 1*a* (*masamba*) and fig. 3 (var. *silia*) belong. *A. strattipocles* is dealt with in the same section of the paper, but as there is no difficulty in identifying this as a good species, it remains only to deal with *masamba* and *siliana*.

M. Oberthür expresses his regret at having sent specimens labelled as *silia*, which do not precisely agree with Mabille's *silia*, and which he now refers to his new species *siliana*. Professor Houlbert has examined the male and female genitalia and also some of the wing scales, and the specific rank of *siliana* is claimed on the following points.

	masaba	*siliana*
H.-w. border upperside	regular outline	indented at 4th nervure.
F.-w. inner margin	suffused with black	not so.
Papilla on which occurs external orifice of bursa copulatrix	rounded	triangular.
Uncus of male	straight	curved.
Scales from f.-w. apical area	suboval	subtriangular.
Ditto from internal angle	rounded	subangulate.

Now, in dealing with these points I should explain that in discussing the forms in my monograph; the supposed examples of *silia* which I had before me were specimens of what M. Oberthür now calls *siliana*, and furthermore amongst those labelled *masamba* were four examples of the *siliana* form, but of the dark ground-colour similar to that in *masamba*, a variety named by M. Oberthür *A. siliana antakara*. It was on these examples that, in speaking of the indentation of the hind-wing border, I based my remark that "the same feature is observable in varying degrees of development in a series of *masamba*." * Having removed these examples, I must admit that the indentation of the border is peculiar to the *siliana* form. Moreover, the black suffusion of the inner margin of the fore-wing in *masamba*, especially in the male, seems a good character. As to the papilla related to the orifice of the *bursa copulatrix* in the respective females, I regret I have not been able to make out this character, alluded to by Professor Houlbert, though it may well be as he states. Greater differences than this occur in the genital plates of forms of *A. acrita*, but do not enable us to define specific limits to those forms. The alleged difference in the uncus in the two species does not appear to me to be valid. The organ in both species is curved in a vertical plane. If Professor Houlbert alludes, as I think he does, to a curve in the horizontal plane, such an appearance in a dry specimen is of no value whatever, since the organ is frequently distorted through desiccation. In the many dissections I have made, I have never found the uncus in any *Acraea* to be curved laterally when once its flexibility has been restored by the caustic treatment. Such a curved condition would be a form of asymmetry, a phenomenon which, so far as my experience goes, does not occur in any species in the male, though one or two females have an asymmetrically placed copulatory orifice (*neobule*, etc.). In my opinion, the male armatures of *masamba* and *siliana* are not distinguishable when the features of these organs are considered as a whole and in relation to those of other species of the genus. In some genera the male armatures are practically indistinguishable, and so useless for specific distinction, but the genus *Acraea* is remarkable for the constant intra-specific differences in the genitalia.

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* This remark of mine is curiously misquoted on p. 170, the word "observable" being printed "*in*observable" and emphasised by small capitals.

Now as to the scales. On Plate LXXIV I have illustrated sixteen examples of scales in an endeavour to confirm Professor Houlbert's conclusions. Figs. 1–5 are taken from the fore-wing apical area of *A. masamba*, and figs. 6–10 from the same area in *A. siliana*. No two are exactly alike, nor do any quite resemble Professor Houlbert's figures on p. 169 of the paper referred to. In spite of diligent search I could find no scales which had not the deeply indented "shoulder" at the base, shown in my drawings, but quite absent in those of Professor Houlbert. Figs. 11–13 are from the fore-wing internal angle of *masamba*, and figs. 14–16 from the same area in *siliana*. So far as I can judge, the outlines of the scales are so variable that they do not furnish a character which is useful in this case for specific distinction. Nor is the outline of scales an entirely satisfactory character for the purpose, since my friend Dr. F. A. Dixey has found that even the Pierine scent scales, so characteristic in most cases, show considerable variation in different individuals of *G. napi*.

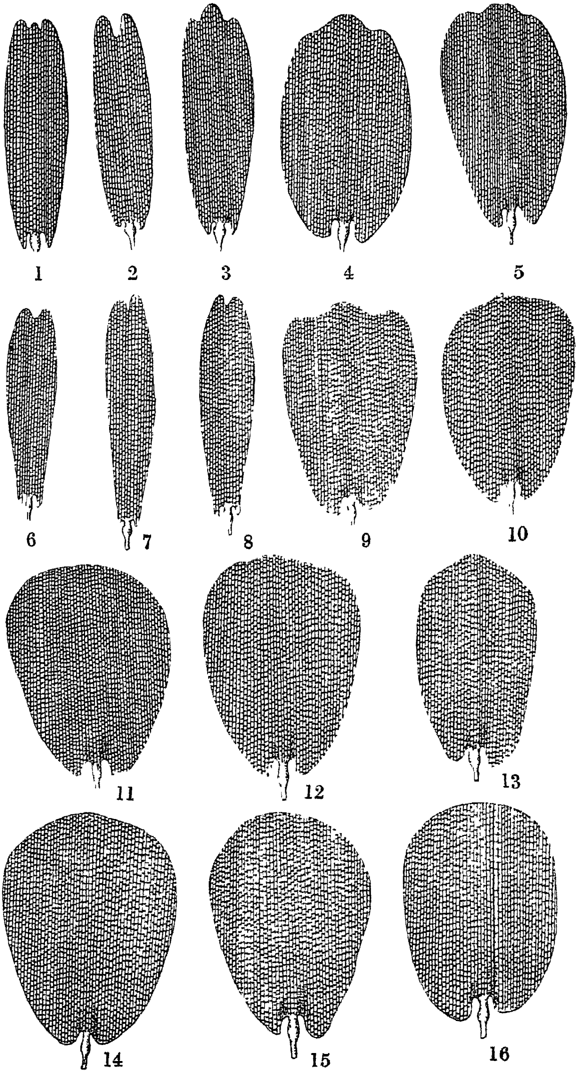
Let us then sum up the whole matter : The most essential and constant differences between the two forms are differences of pattern. The structural differences are very slight and open to question. In my monograph of the genus I stated that "with our present conception of the evolutionary nature of species formation the precise limitation of what is called a 'species' has necessarily lost much of its importance, as compared with the recognition of the degrees of affinity which appear to obtain between the forms studied. . . . In many cases it is extremely difficult, if not impossible, to decide whether a form has yet passed over that dividing line which separates one true species from another. The difficulty experienced is merely a confirmation of our theories of species formation." *A. siliana* does not appear to occur in precisely the same localities as *A. masamba.* The characteristics of *A. siliana* as compared with *A. masamba* are equivalent to those I should regard as applying to a subspecies, *i.e.* a geographical race not entirely and specifically separate. M. Oberthür prefers to regard the two forms as distinct species. After all, it is of little real importance which view we adopt. The case is similar to that of *A. welwitschii* and *A. anemosa.*

Finally, I should wish to express my appreciation of M. Oberthür's most valuable and interesting contribution to our knowledge of the Acraeas, of M. Culot's exquisite plates, and of Professor Houlbert's beautiful drawings. The structural features of the Lepidoptera have too long been obscured by the dazzling beauty of their wings, and we shall look forward with pleasurable anticipation to further valuable communications from so ideal a collaboration as that of M. Charles Oberthür and Professor Houlbert.

EXPLANATION OF PLATE LXXIV.

FIGS. 1–5. Scales from f.-w. apical area of *A. masamba.*
6–10. ,, ,, ,, ,, ,, *A. siliana.*
11–13. ,, ,, ,, internal angle of *A. masamba.*
14–16. .. ,, ,, ,, ,, *A. siliana.*

DECEMBER 29, 1916.



H. Eltringham, del. *André, Sleigh & Anglo, Ltd*

SCALES OF ACRAEA.

9

XI. *On the Species of the Genus* Larinopoda *Butler*. By H. Eltringham, M.A., D.Sc., F.Z.S.

Plates X, XI.

[Read May 3rd, 1922.]

The genus *Larinopoda* was founded by Butler in 1871 (Trans. Ent. Soc. p. 172, 1871). Doubtless at that time the classification of the Rhopalocera on the structure of the feet was not generally understood. In any case, Butler seems to have had some difficulty in placing the genus, and states that though "evidently belonging to the Pierinae" it seems to be intermediate between *Eronia* and *Deloneura*. He states that its "natural position in the Pierinae is between *Nepheronia* and *Euchloe*."

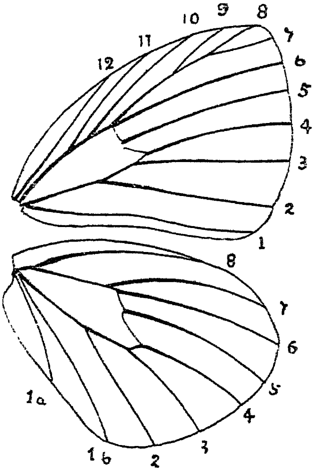
His description of the genus is as follows:—

> "Wings pyriform; front wings with five subcostal branches, the first emitted at a short distance before the end of the cell, the second immediately before the end, the third half-way between the cell and apex; the fourth and fifth at two-thirds the distance from the cell to the apex; upper discocellular short, slanting obliquely inwards; lower three times the length of upper, angulated, slanting obliquely outwards; median branches emitted near together; hind-wings with subcostals emitted close together, so as to reduce the upper discocellular to a point; lower discocellular very oblique, about eight times the length of the upper; second and third median branches emitted at about half the distance from each other that exists between the second and first; body short, robust; abdomen swollen beneath; legs thick, antennae short, slender, feebly clubbed; palpi long, slender, not hairy."

The type of the genus is given as *Larinopoda lycaenoides*, but the same insect had been described by Hewitson five years previously as *Liptena lircaea*. It is rather remarkable that Hewitson recognised this species as a Lycaenid and in the same year not only placed the species now known as *Citrinophila erastus* amongst the Pierinae, but exhibited considerable annoyance when its real affinity was pointed out by the late Roland Trimen. (See Proc. Roy. Soc. B. vol. 91, 1920, pp. xxiv, xxv.)

Smith and Kirby mention the genus again in 1887 (Rhop. Exot. Lycaen. vol. 1, Oct. 1887), referring it to the Lycaenidae, but they immediately proceed to include in the genus species of *Pentila* and *Liptena*, the neuration of which does not agree with that of *Larinopoda*. The neuration is correctly illustrated by Röber (Staud. & Schatz, Exot. Schmett, pl. 50, 1892) and also in the accompanying text figure.

Larinopoda belongs to that section of the Lycaeninae in which there is no precostal nervure in the hind-wing, a character which distinguishes it from *Alaena*, *Pentila*, and *D'urbania*. Nervures 6 and 7 in the h.-w. do not arise from a common stalk, thus distinguishing the genus from *Mimacraea*, *Pseuderesia*, *Citrinophila*, *Eresina*, and *Argyrocheila*.



Its further characters as given by Aurivillius (Rhop. Aeth, p. 253, 1898) are as follows :—

> F.-w. nervure 6 arises from the end of cell, the f.-w. has 12 nervules, the inner margin of the h.-w. is straight or slightly convex. The cell of both wings is posteriorly sharply edentate so that the posterior angle is projecting, especially in h.-w. The lower discocellular of the h.-w. is very long, straight or somewhat bent outwards. Nervures 3 and 4 of the h.-w. always widely separated at origin. The two antepenultimate abdominal segments in the female hemispherically swollen.

At present the genus is known to contain only a few species of small white or cream-coloured butterflies with shaded or black markings. They are all found in the Ethiopian Region and are principally of W. African origin. Specific diagnosis on the somewhat feeble external characters is unsatisfactory, and I have therefore endeavoured to rearrange the known forms in accordance with the structure of the male armature.

This organ is of a rather complicated type. To give illustrations of the whole apparatus in each case would be misleading, since the slightest difference in the point of view would suggest differences of structure not really existing. Indeed, a considerable experience of these organs in different genera convinces me that the person actually making the preparations is probably the best qualified to judge of differences and resemblances.

Careful dissection under the stereoscopic microscope gives a general impression of structure, and above all of relative position. The ultimate preparations should be mounted in cells so that they are not distorted by pressure, and for purposes of illustration good drawings are always preferable to photographs, since the latter convey little or no impression of relative position. At Pl. X, fig. 2, I have drawn the entire apparatus taken from a form of *Larinopoda aspidos* f. *brenda.* There are two claspers the distal ends of which are characteristically lobed, the uncus is blunt and bifid, and below it there are two hooks more clearly shown in fig. 3, which is a posterior view of this part in *L. tera.* Each clasper, near the proximal end and on its lower side, has a small chitinous projection which appears to be attached by strands of rather tough connective tissue to a ventral projection on the aedeagus. The latter is a rather unusually shaped organ, the duct enters it more or less in the middle, and the part more proximally situated is apparently in the form of a lever.

The uncus and claspers are connected by webs of tough membrane not shown in the figure.

After some experiment I have decided that the best type of illustration for exhibiting the specific differences between the armatures in this genus is a dorsal view of the two claspers placed as nearly as possible in their natural position. For this purpose the rest of the armature is cut away and the claspers left with their natural membranous connection and mounted in that position in a cell. The remaining illustrations are all drawings of the claspers taken from this point of view.

On the posterior end of the thorax just above the attachment of the abdomen there appears to be a membrane divided into two nearly circular tympana. Whether this is merely the structure of that part of the thorax or is an organ comparable to the thoracic tympanum in Geometridae, Uranidae and other moths, I am unable to decide until I can obtain material in a proper condition for dissection.

KEY TO SPECIES AND FORMS OF *LARINOPODA*.

	H.-w. beneath with a spot in cell.	(*a*).
	H.-w. beneath without a spot in cell.	(*b*).
(*a*)	H.-w. beneath with delicate undulating shading.	*tera.*
	H.-w. beneath without delicate undulating shading	*eurema.*
(*b*)	H.-w. beneath with dark border, broad and even or broken into more or less triangular spots, or even merely suffused.	(*c*).
	H.-w. beneath without dark border.	(*g*).
(*c*)	Ground-colour cream white, h.-w. border broken into triangular spots.	(*d*).
	Ground-colour chalk white, h.-w. border not broken into triangular spots.	(*e*).
(*d*)	H.-w. beneath with submarginal spots.	*lircaea* f. *spuma.*
	H.-w. beneath without submarginal spots.	*lircaea* f. *hermansi.*
(*e*)	H.-w. beneath with submarginal spots.	*aspidos* f. *brenda* (*part*).
	H.-w. beneath without submarginal spots.	(*f*).
(*f*)	H.-w. above with broad dark border.	*aspidos aspidos*, ♂.
	H.-w. above without broad dark border.	*aspidos aspidos*, ♀.
(*g*)	Ground-colour creamy white . . .	*lircea.*
	Ground-colour chalky white.	(*h*).
(*h*)	H.-w. with submarginal spots.	(*i*).
	H.-w. without submarginal spots.	*lagyra.**

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* Occasional examples of *aspidos* female have hardly any brownish scaling beneath and are very difficult to distinguish from *lagyra.* Generally, however, at least a few such scales can be distinguished.

(*i*). H.-w. beneath with brownish dusting at inner angle . . . . *aspidos* f. *brenda* (*part*).
H.-w. beneath without brownish dusting at inner angle. . . . *lagyra* f. *punctata*.

LARINOPODA LIRCAEA. Pl. X, fig. 1, Pl. XI, fig. 6.

Hew., Exot Butt. (*Pentila and Liptena*), pl. 1, f. 10, 11 (1866); Staud., Exot. Schmett., 1, p. 268, pl. 94 (1888); Smith and Kirby, Rhop. Exot., 24, Lyc. Afr., p. 95, pl. 21, f. 10 (1893); Auriv., Ent. Tidskr., 16, p. 199 (1895); Rhop. Aeth., p. 272 (1898); Strand, Archiv. f. Natursgesch. Abt., 12, p. 133 (1913); Auriv., in Seitz, Macrolep., p. 329, pl. 63*d* (1914–18).

= *lycaenoides*. Butl., Trans. Ent. Soc. Lond., p. 173, pl. 7, f. 2–5 (1871).

NIGERIA. GABOON. CAMEROON. CONGO. ANGOLA. BAHR-EL-GHAZAL.

lircaea ab. *alaenica*. Strand, Archiv. f. Natursgesch. Abt. A, 12, p. 133 (1913).

SPANISH GUINEA (Alen Benito).

lircaea ab. *alenicola*. Strand, *l.c.*

SPANISH GUINEA (Makomo Campo).

lircaea ab. *benitonis*. Strand, *l.c.* p. 134.

(Alen Benito).

lircaea ab. *makomensis*. Strand, *l.c.*

(Makomo Campo).

lircaea ab. *simekoa*, Strand, *l.c.*

CAMEROON (Simekoa).

lircaea ab. *bibundica*. Strand, *l.c.*

CAMEROON (Bibundi).

lircaea f. *hermansi*, Auriv., Öfvers. Vet. Akad. Förhl., 53, p. 435 (1896); Rhop. Aeth., p. 273 (1898); in Seitz, Macrolep., p. 329 (1914–18). Pl. X, fig. 2 (*prox.*).

CONGO (Uhangi R.).

lircaea f. *spuma*, Druce, Proc. Zool. Soc. Lond., p. 361 (1910); Auriv., in Seitz, Macrolep., p. 329, pl. 63f. (1914–18). Pl. X, fig. 3.

CAMEROON (Bitje, Ja River).

lircaea f. *innocentia*. Gaede, Int. Ent. Zeit. Guben, 9 Jahrg., No. 21, p. 111 (1916) (as *Larynopoda*).

CAMEROON (Dengdeng).

lircaea lircaea.

Exp. 40–50 mm. Sexes not specially differentiated in pattern. Ground-colour creamy white. F.-w. costa slightly blackened at base, the dark scales reduced to a very fine line a little beyond middle. Apex with sepia scaling forming a border about 1·5 to 2 mm. wide at apex, with a tendency to invasion of the ground-colour on nervule ends. This apical darkening extends as far as nervule 3. H.-w. all cream white.

Underside. F.-w. much as above but apical dark colour reduced to faint subtriangular marginal marks or even to a fine marginal line. On costa, just above cell end, a well-defined subtriangular, almost black mark, its base on costa. H.-w. with a rounded sepia black submarginal spot in 6, and a small similar spot in 1*c* opposite origin of nervule 2.

There is a certain amount of variability in more or less typical forms of this species, especially in the extent of the f.-w. apical blackening. The costal black varies in width and is sometimes rather sharply cut off opposite cell end. It can be distinguished from other species except *tera* by its cream-white ground-colour, and *tera* has a spot in h.-w. cell beneath. Strand has described and named several variations. Whether they all really belong to the present species it would be impossible to say without examination, but as the descriptions are published I give a short account of them here.

lircaea ab. **alenica.**

F.-w. apical black 3 mm. wide at apex and reaches beyond nervule 2.

lircaea ab. **alenicola.**

F.-w. apical black 4 mm. broad at apex but does not reach 2, its inner edge somewhat dentate. Beneath, apex and margin suffused with greyish. H.-w. beneath with two black quadrate spots near anal angle. In female the f.-w. black reaches inner margin, and in h.-w. underside there is in all areas an obsolescent black submarginal spot. In cell a minute black dot.

I think it extremely improbable that this is a form of *lircaea* at all. It is probably a variety of *eurema.*

lircaea ab. **benitonis.**

Apical band as in *alenicola.* The black marginal band in basal half of costal area is slightly broader and square cut at end. Underside of h.-w. with six distinct black submarginal spots.

lircaea ab. **makomensis.**

Apical band 3·5 mm. broad and extending backwards to 2. H.-w. with black marginal band of ·5 mm. but increased to 1 mm. at apex, and similar on both sides, below with dark grey spots in 1c, 2, 4, and 5. Black marginal band in basal half of f.-w. costa not square cut at end.

lircaea ab. **simekoa.**

Resembles Kirby and Smith's figure of *lircaea* female, but marginal band not quite so broad, and more pointed posteriorly. The black quadrate costal spot merely indicated. Underside differs considerably from the figure alluded to, in that the apical and marginal border, though nearly as broad as above, is only a little darkened, without distinct apical spots, whilst in h.-w. submarginal spots are present in 1c to 5, in addition to the usual large black spot in 6.

lircaea ab. **bibundica.**

Both sides pure white. Apical band at apex 3·5 mm. broad, ending in a line shortly beyond 2. On underside this band shows through somewhat. A small black spot at apex, and the costal spot projects sharply. The costa between this and base merely lined with black. H.-w. below with only the two usual black spots.

This form is probably a variety of *lagyra.*

lircaea f. **hermansi.**

Ground-colour cream white. F.-w. costa rather narrowly black, usually suddenly narrowing to a line opposite anterior angle of cell, and then widening into a dark apical border, 4–6 mm. wide, which, gradually diminishing in width, extends round margin to the hind angle. H.-w. with a marginal black border 2–3 mm. wide, invaded by the ground-colour at nervule ends so that it has a dentate or subtriangular appearance in the internervular spaces.

Underside. F.-w. as above but dark markings paler, and a well-marked black subquadrate spot on costa opposite end of cell. H.-w. as above but with a large rounded spot in 6, and a spot in 1c opposite origin of nervule 2.

lircaea f. **spuma.**

Resembles f. *hermansi,* but has a submarginal row of spots on underside of h.-w.

In the Tring Museum there is a remarkable form of *hermansi* labelled "Tambura, S. Bahr el Ghazal," in which the dark borders, though greyer, are much extended. That of the costa reaches to the subcostal, and the apical darkening, though barely reaching the hind angle, is 8 mm. wide at apex. The h.-w. hind-marginal border is 3 mm. wide, and above shows little indentation. Beneath, the h.-w. shows no trace of submarginal spots, and the usual rounded spot in 6 is merged in the dark border. This is the only example I have seen from this locality, and curiously enough there is also one example of *lircaea lircaea* bearing the same label, and it is quite typical, though if anything with rather less black at f.-w. apex. It would be interesting to have more specimens from this locality. The armature of the *hermansi* form is the same as in the other examples. The *lircaea* form is a female. When Druce described his *Larinopoda spuma* he added that it might be a form of *lircaea*, though he does not give any reason for the suggestion. I have not found in collections any examples of *lircaea* from localities agreeing with those of *spuma* and *hermansi* except the two specimens from Bahr el Ghazal above mentioned. The armatures of *lircaea* and *hermansi* are not distinguishable from each other or from that of *spuma*, though easily recognised as different from those of the other described species, and I am satisfied that these three forms are specifically identical.

lircaea f. innocentia.

Described as resembling Strand's *makomensis*, but differing from all other forms of *lircaea* in the smallness of f.-w. costal spot and the spots in h.-w. 1c and 6. All other markings absent.

LARINOPODA EUREMA. Pl. X, fig. 10; Pl. XI, fig. 5.

Plötz, Stett. Ent. Zeit., 41, p. 199 (1880); Smith and Kirby, Rhop. Exot., 11, p. 38, pl. 9, ff. 7, 8 (1890); Auriv., Rhop. Aeth., p. 273 (1898); in Seitz, Macrolep., p. 329, pl. 63 f. (1914–18).

♂ = *varipes.* Kirby, Ann. Nat. Hist., (5), 19, p. 363 (1887); Smith and Kirby, Rhop. Exot., 2, pl. 2, ff. 5, 6 (1887).

= *libussa.* Staud., Exot. Schmett., 1, p. 268 (1888).

AFRICA, W. COAST. S. LEONE to FRENCH CONGO.

Typical examples may be thus described :—

Exp. about 40 mm. ♂ chalky white. F.-w. with costa rather broadly blackened, slightly wider at cell end, then narrower, and again widening out into apical black which is about 6 mm. wide at apex, and continues in a gradually narrowing hind-marginal border to hind angle.

H.-w. with a marginal black line and within this a dusting of sepia black scales, slight at apex but considerably extended at ends of areas 3 and 2. Black spots of underside showing through rather conspicuously.

Underside. F.-w. as above but dark markings paler. A costal spot above end of cell at which costal black abruptly terminates.

H.-w. with margin as above. In 6 a sub-marginal rounded dark spot and often a minute one above it in 7. A small rounded spot in 1*c* opposite origin of nervule 2, and a larger conspicuous black spot in cell, and sometimes a second minute one above it. ♀ like the ♂ but with only a dark marginal line on h.-w., and reduced dusting of dark scales beneath.

The amount of sepia black scaling in this species varies in both sexes, and minute additional spots sometimes occur on the underside. A male example from Kumassi has nearly as much dark marginal border as *aspidos*, and on the underside there is a second small dark spot beneath that in h.-w. 6.

In some females the dark scaling is reduced to a mere greyish suffusion, but in all the 44 examples before me the spot in h.-w. cell beneath is constant, and this serves to distinguish it from other species except *tera*, from which it can be separated by the pure chalky whiteness of the underside.

The species is very closely allied to *aspidos*, and there is but little difference between the male armatures.

LARINOPODA ASPIDOS. Pl. X, figs. 7, 8; Pl. XI, fig. 4.

H. H. Druce, Ann. Nat. Hist., (6), 5, p. 25 (1890); Karsch, Berl. Ent. Zeit., 38, p. 215 (1893); Auriv., Rhop. Aeth., p. 273 (1898); in Seitz, Macrolep., p. 329 (1914–18).

TOGOLAND. NIGERIA (Lagos, Benin).

f. *latimarginata*.

Gr. Smith, Novit. Zool., 5, p. 354 (1898); Auriv., Rhop.

Aeth, p. 273 (1898); in Seitz, Macrolep., p. 329, pl. 63 f. (1914–18).

NIGERIA (Warri, Lagos).

f. *brenda*. Pl. X, fig. 9; Pl. XI, fig. 2.

H. H. Druce, Ann. Nat. Hist., (7), 11, p. 69 (1903); Auriv., in Seitz, Macrolep., p. 329 (1914–18).

With type form.

Exp. about 40 mm. ♂ chalky white. F.-w. with sepia black on costa extending rather beyond end of cell, where the dark colour widens into a black subapical and marginal border 5–8 mm. wide at apex, gradually narrowing to hind angle, where it is 2–3 mm. wide. H.-w. with a dark border of fairly even width (about 2–3 mm.) extending from apex to anal angle.

Underside with sepia black markings as on upperside. F.-w. with a black dentate mark about middle of costa and h.-w. with a round black spot opposite origin of nervule 2, and a larger submarginal spot in 6, often merged into the black border.

♀ variable, but with less black than in ♂. Generally only with a blackened f.-w. apex, and little or no black beneath except the f.-w. costal spot and the two spots on h.-w.

f. brenda.

In this form, the type of which is a male, the upperside has the appearance of the female of the typical form. Beneath, the f.-w. has the costa rather broadly black as far as end of cell, where the dark colour is somewhat abruptly terminated by the dentate costal spot. Apex paler than on upperside. H.-w. with the usual spots in 1*c* and 6, but with a row of delicate submarginal marks in the internervular spaces in 1*c* to 5, that in 1*c* doubled. Hind and inner margins with a fine black line.

f. latimarginata.

Appears to differ from typical *aspidos* only in that the dark h.-w. marginal border beneath is continued, though more narrowly, along the inner margin. Probably Grose Smith had not seen *aspidos* when he described this form as a species, but it is difficult to understand why Prof. Aurivillius keeps it as a separate species in Seitz's work. It occurs commonly in long series of the type form from Lagos.

The Hope Department possesses long series of *aspidos* taken near Lagos by Mr. Lamborn. Several pairs were taken *in coitu*, and the female is always much less black than the male. There is, however, considerable variation, and some females have the h.-w. underside much darkened along the margin, especially at anal angle, and where this marginal darkening is obsolescent a submarginal series of spots remains. Some females have also a darkened h.-w. margin on upperside, but apparently never so complete a border as in the male. There is variation from the typical male to the *brenda* form, some males having a reduced blackening on the h.-w. margin. The *brenda* form seems really to be a male with the pattern of the female, the black h.-w. border being practically absent above and reduced to submarginal spots beneath. Occasional female examples are all white above with the f.-w. apices merely greyish. The species and probably the whole genus would appear to be very distasteful, as they are very easily caught, and in fact can be picked up with the fingers.

LARINOPODA TERA. Pl. X, figs. 11, 12; Pl. XI, figs. 1, 3.

Hew., Ent. Mo. Mag., 10, p. 125 (1873); Auriv., Rhop. Aeth., p. 273 (1898); Neave, Proc. Zool. Soc. Lond., p. 43 (1910); Auriv., in Seitz. Macrolep., p. 329, pl. 63 f. (1914–18).

= *soyauxii*. Dew., Nov. Act. Acad. Nat. Cur., 41, 2, p. 201, pl. 26, f. 10 (1879); Smith and Kirby, Rhop. Exot., 15, p. 51 (1891); pl. 12, f. 9, 10, (as *soxauxii*) (1891); Auriv., Rhop. Aeth., p. 273 (1898).

CAMEROON to UGANDA.

Exp. 30 to 40 mm. Sexes not markedly different. Typical examples are white or dusky white. F.-w. dusted with sepia on costa and with a sepia brown apical patch some 6 mm. wide at costa and gradually narrowing posteriorly, sometimes reaching hind angle but generally ending in 2. H.-w. often brownish at inner angle and the shaded markings of underside produce a faint pattern.

Beneath the f.-w. has a brown triangular mark on costa opposite end of cell and the apex is shaded with pale brown. The h.-w. has a spot in cell, sometimes two or three, and there may be a spot in 7 and 1*c*, and another on discocellulars. The discal and marginal areas have pale brown undulating markings of a pattern too inconstant to be usefully described.

The undulating shading of the h.-w. underside suffices to distinguish this species. Western examples generally have the dusky markings most highly developed, and as we proceed eastwards these are gradually reduced until examples from the Toro Forest have a chalky white ground-colour, a mere suffusion of brownish at f.-w. apex, and only a trace of the h.-w. markings beneath. As an exception there are examples from Sesse I., Uganda, as dark as Western forms.

The claspers show a structure allied to that in *aspidos*, but the upper edge is smoother and the spatulate processes less expanded.

LARINOPODA LAGYRA. Pl. X, figs. 4, 5, 6; Pl. XI, figs. 7, 8, 9.

Hew., Exot. Butt. (*Pentila* and *Liptena*) Pl. 1. f. 4 (1886); Smith and Kirby, Rhop. Exot., 24, p. 93, pl. 21, f. 6 (1893); Auriv., Öfvers, Vet. Akad. Förhandl., 53, p. 435 (1896); Rhop. Aeth., p. 272 (1898); H. H. Druce, Proc. Zool. Soc. Lond., p. 362 (1910); Auriv., in Seitz. Macrolep., p. 329 (1914–18).

= *lara.* Staud., Iris, 4, p. 218 (1891); Smith and Kirby, Rhop. Exot., 21, p. 73, pl. 18, f. 1, 2 (1892).
= *lircaea.* Smith and Kirby, Rhop. Exot., 24, p. 95, pl. 21, f. 11, 12 (1893).

CAMEROON. CONGO. TORO.

lagyra f. *gyrala.*
Suff. Iris, xvii, p. 49 (1904); Auriv., in Seitz, Macrolep., p. 329, pl. 63 f. (as *gyrula*) (1914–18).
With typical forms.

lagyra f. *emilia.*
Suff. *l. c.* p. 48 (1904); Auriv., *l. c.* p. 329 (1914–18).
With typical forms.

lagyra f. *punctata.*
Druce, Proc. Zool. Soc. Lond., p. 361 (1910); Auriv., *l. c.* (1914–18).

The name *lagyra* is at present applicable to forms of *Larinopoda* described below, but it would appear that there are in fact three species which are not distinguishable on outward characters.

lagyra lagyra.

Exp. 30 to 50 mm. No constant difference in markings of sexes. Ground-colour chalky white. F.-w. with sepia black scaling on costa from base to about middle, where it may be suddenly narrowed or may run over into apical black. The latter varies from about 10 to 3 mm. wide at apex, and may extend as a marginal border as far as 2 or to hind angle. H.-w. chalky white, spots of underside showing through from beneath.

Underside. F.-w. as above, but apical black paler. Every gradation from this to a mere black marginal line and a blackish spot at apex in 7. A subtriangular costal spot opposite end of cell. H.-w. chalky white with a rounded dark spot in 6, sometimes a smaller one in 5, or in 5 and 7. A small spot in 1*c* opposite origin of nervule 2. Sometimes a double spot at anal angle.

The *lagyra* forms are distinguished from *eurema* by the absence of a spot in h.-w. cell beneath, and from *aspidos* female by the fact that the latter nearly always has at least a dusting of brownish scales near anal angle of h.-w. beneath. This character is not, however, quite constant and there are females of *aspidos* that cannot with certainty be distinguished from *lagyra*.

Suffert's name *gyrala* is applicable to forms in which the f.-w. costal black is rather broad and runs over into the apical black, whilst there are small spots on h.-w. underside in 5 and 7. The same author's *emilia* is even less distinctive, merely having the f.-w. apical black rather broader than in the type. Druce's *punctata* has a submarginal row of spots on the h.-w. underside.

The forms referable to *lagyra* present considerable difficulties from a taxonomic point of view. If we deal with them on the structure of the male armature, then we must conclude that there are at least three species, one of them very distinct. On Plate XI are drawings of the armatures of these three forms. Fig. 9 represents the claspers of a specimen from the Ja River district in S. Cameroon. The claspers are bifid, thus differing from those of other species of the genus. Fig. 8 is taken from an example from the Upper Kassai district. Here the claspers are still bifid, but the lower fork is much longer than the upper. Fig. 7 is from a specimen taken at Port Victoria, Cameroon, and differs entirely from 9 and 8 and from all other preparations examined. Nearly 60 specimens of the *lagyra* form are before me, and careful comparison shows that whilst they vary in the extent of the f.-w. black, and in the spotting of the h.-w. underside, there are no constant pattern characteristics correlated to the three forms of genitalia described that would enable us to separate them into three species. There are examples from Gaboon, Ituri Forest, and Toro, but unfortunately most of them are females. One male Toro specimen has claspers like 8, and an example from Buamba Forest, Semliki Valley, is somewhat intermediate between 8 and 9, though closer to 8.

In the genus *Neptis* we have *N. swynnertoni* and *N. neavei* from Mt. Chirinda and Mt. Mlanje respectively, presenting differences in the claspers without constant differences in the external characters, but here there is comparative isolation by separate elevated positions.

Judging from a modelled map of Africa there would seem to be no insuperable physical barrier to account for an asyngamic isolation of the Ja River and Port Victoria specimens, and yet the difference between these two is very marked. In the absence of sufficient material from intermediate localities, if indeed the butterfly occurs in such districts, we can do little more than record the fact that the name *lagyra* at present applies to a series of forms so far outwardly indistinguishable, but including at least three probably asyngamic communities.

With the exception of the forms of *lagyra* the species of *Larinopoda* seem well defined and the armatures distinctive and constant. An incident in the present investigation supports this view. Amongst the material of *lagyra* I found a single example from Sierra Leone. On making a preparation of the armature I was surprised to find that the structure was the same as in *eurema*, the species which is distinguished by having a black spot in the h.-w. cell beneath. There appeared to be no trace of this spot till I made a microscopical examination, when I found, where the spot should be, a few grey-black scales. The specimen is, in fact, an example of *eurema* with the spot almost obsolete.

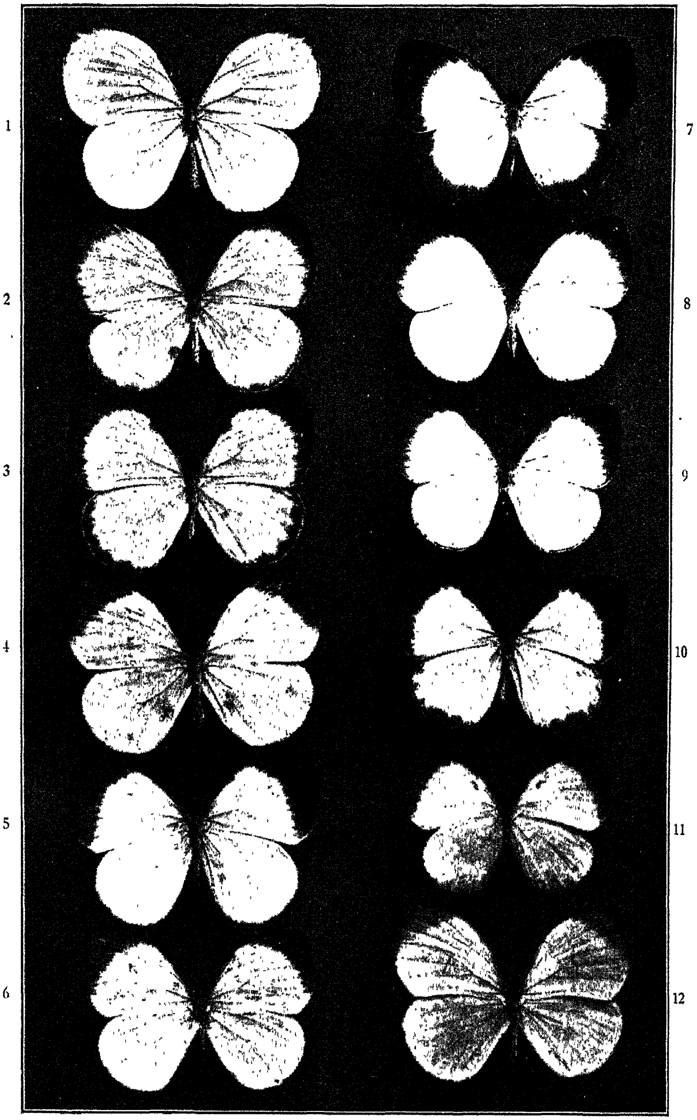
EXPLANATION OF PLATE X.

FIG. 1. *Larinopoda lircea lircea* Butl. ♂, N. Cameroon (Coll. Joicey).
2. ,, *lircea* ♀, near *hermansi* Auriv. (intermediate between *hermansi* and *lircea*), Ja River, Bitje, Cameroon (Coll. Joicey).
3. ,, *lircea* f. *spuma* Druce ♂, Ja River (Mus. Tring).
4. ,, *lagyra* Hew. ♀, Upper Kassai River (Oxford).
5. ,, ,, ♀, Ja River (Tring).
6. ,, ,, ♀, ,, ,, ,,
(This example is figured to show that the shape and extent of the f.-w. apical black is not constantly different in Ja River and Kassai River examples.)
7. *Larinopoda aspidos* Druce ♂, Oni, Nigeria (Oxford).
8. ,, ,, ,, ♀ ,, ,, ,,
9. ,, ,, f. *brenda* Druce ♂, Oni, Nigeria (Oxford).
10. ,, *eurema* Plotz. ♂, S. Leone (Tring).
11. ,, *tera* ♀, Ogowe (London).
12. ,, ,, ♂, Toro Forest (London).
(Examples from the last locality are whiter, generally larger, and have less shading in h.-w. beneath.)

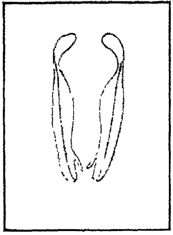
EXPLANATION OF PLATE XI.

Male Armatures.

FIG. 1. *Larinopoda tera* (claspers).
2. ,, *aspidos* f. *brenda.*
3. ,, *tera* (girdle).
4. ,, *aspidos aspidos.*
5. ,, *eurema.*
6. ,, *lircea lircea.*
7. ,, *lagyra* (Port Victoria).
8. ,, ,, (Upper Kassai River).
9. ,, ,, (Ja River, Cameroon).



FORMS OF LARINOPODA



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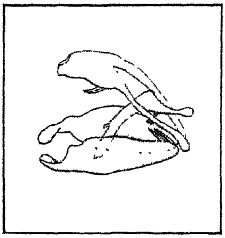

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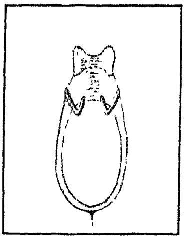

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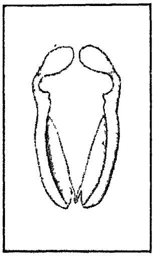

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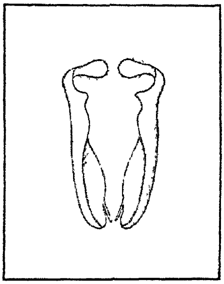

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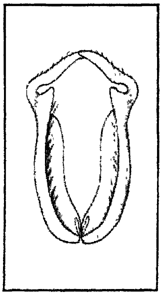

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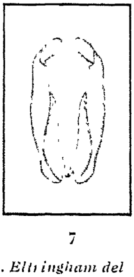

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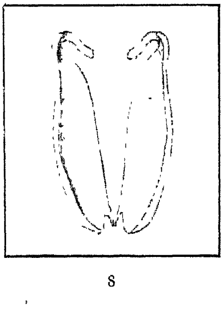

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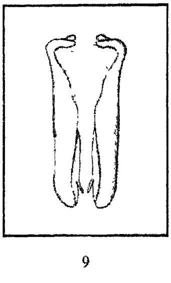

9

H. Eltringham del

GENITALIA OF LARINOPODA

X. *The* charina *Group of* Pinacopteryx. By F. A. Dixey, M.A., M.D., F.R.S., Subwarden of Wadham College, Oxford.

[Read May 1st, 1918.]

The assemblage of Pierine species including *cebròn* and *capricornus*, Ward, *pigea* and *charina*, Boisd., with others nearly related to them, forms a natural group which may either be considered as a separate genus under the name of *Pinacopteryx*, or as a section of *Pieris* in the wide sense; the latter course being taken by Trimen in " South African Butterflies," vol. iii, p. 39; and by Aurivillius in Seitz's " Macrolepidoptera: Ethiopian Region," Eng. trans., p. 45.

In Proc. Ent. Soc. Lond., 1912, pp. cx–cxiv, it was remarked that the group headed by *P. charina* was distinct in several particulars from the remainder of the section or genus, and in the same " Proceedings " for 1909, pp. cix, cx, some account was given of the peculiarities of the scent-scales which characterise this *charina* group; an outline figure being added of the curious plume-scale of *P. liliana*, Gr. Smith (*Ibid.*, Pl. E, fig. 10). I now propose to deal in somewhat greater detail with the members of this section, as regards which there has been a certain amount of confusion.

The *charina* group, as has been pointed out by Aurivillius,[*] is distinguished from the remaining species of *Pinacopteryx*, which may be called for convenience the *pigea* group, by the possession on the lower discocellular vein of both wings, or at least of one wing, of a black spot or dot beneath, often occurring on the upper surface also. This, though in practice a useful distinction, does not invariably hold good; for in one or two forms of the *pigea* section a dot may be present in the assigned situation, and in one form at least of the *charina* section both surfaces of both wings may be devoid of any such marking.

A more constant distinction, so far as the males are concerned, is afforded by the genitalia.[†] In all the species of the *pigea* group, the clasper ends posteriorly in two spinous prolongations, one placed dorsally to the other (fig. 1). These are usually very well marked; but in one species, viz. *P. spilleri*, Stdgr., they are exceptionally short, though still easily visible. In the *charina* group the clasper is furnished posteriorly with only one spine instead of two (fig. 2).

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[*] *Op. cit.*, p. 46.

[†] This, I believe, was first observed by my friend Dr. H. Eltringham.

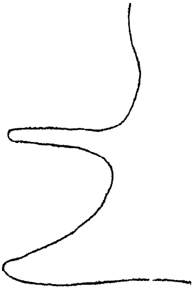
Fig. 1.—*P. orbona*, Hübn. Doubled spine of clasper × 54.

The members of this latter group are probably best regarded as a single species including several geographical forms of subspecific rank. The form which is most distinctly marked off from the rest would seem to be *charina* itself. This was described by Boisduval from males and females captured in Kaffraria. Aurivillius in Seitz, *loc. cit.*, gives the distribution of *charina* as "South Africa to German East Africa," but I have not seen any specimens of this southern subspecies from further north than the Transvaal. Another form which seems to be easily distinguishable is that described by Grose Smith * as *Belenois liliana*, and figured by Grose Smith and Kirby † as *Pinacopteryx liliana*. The locality given by the describer is Mombasa, and the same form is found in the surrounding region at least as far to the west and north as Taveta and

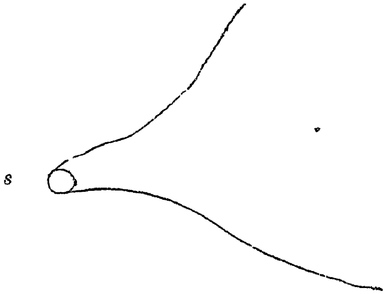

Fig. 2.—*P. charina*, Boisd. Single spine of clasper × 54.

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* Ann. Mag. Nat. Hist., Series 6, vol. 3, p. 122 (1889).

† Rhop. Exot., *Pinacopteryx*, Pl. I, figs. 7, 8 (♂), 9 (♀).

Machakos. *Pinacopteryx gerda*, figured and described by Grose Smith and Kirby (*loc. cit.*, figs. 10, 11), also from Mombasa, is probably a male of *P. liliana* somewhat smaller than the average and less heavily marked with black. Specimens from the Voi River, the Tana River and Mlegwa, all in British East Africa, correspond in appearance with *Pinacopteryx gerda*.

There remain certain forms, allied to the foregoing and to each other, which have been known under the names of *P. doxo*, Godt., *P. simana*, Hopff., and *P. venata*, Butl. *P. doxo* was the first member to be noticed of the whole *charina* group. It was described by Godart * in 1819 as *Pieris doxo*. Godart's type is in the Dufresne Collection, now at Edinburgh, and has been figured by Mr. P. Grimshaw in Trans. Roy. Soc. Edin., vol. xxxix, Pl. I, fig. 6 (1900). It is a female in somewhat poor condition. The locality is left blank by Godart; but Boisduval,† who reproduces Godart's description, says, "Afrique probablement." A careful examination of the type specimen makes it tolerably clear that it is a *Pinacopteryx* of the group at present under discussion, though it is by no means easy to assign it to its proper place among the forms included in that section. On the whole I should be disposed to agree with Aurivillius (*loc. cit.*, p. 46) that it belongs to the form afterwards described by Hopffer as *Pieris simana* (types from Mozambique), were it not improbable that any of Dufresne's collection came from that region. As the case stands, I suspect that Godart's type may be really a somewhat unusual example of the wet-season form of *P. charina* from the region of the Cape. It is, however, not exactly like any *Pinacopteryx* that I have ever seen, and it differs considerably from the figure of "*doxo* ♀" in Seitz, *op. cit.*, Pl. XIV, e. This figure, indeed, probably represents a dry-season female of Grose Smith's *liliana*, and was certainly not drawn from Godart's type.

The type of *P. doxo* thus being a battered female of unknown locality, its determination is so uncertain a matter that I venture to think it best to drop the name altogether as a specific or subspecific designation. The next question to arise is that of the relation of *P. simana* to *P. venata*. Butler's type of *P. venata*, a female, came from the White Nile; it was described and figured by him in Trans. Ent. Soc. Lond., 1871, p. 169, Pl. VII, fig. 7, as *Ixias venatus*. The male of this form was unknown until 1902, when Mr. Loat captured one at Gondokoro; this was described in Trans. Ent. Soc. Lond., 1903, p. 152. The male type and a female from Shambî on the White Nile were well figured by Dr. Longstaff.* *P. simana*, as already stated, was described by Hopffer from Mozambique. Both sexes are figured by Peters.† The name *venata* is not inappropriate to Butler's type, which is somewhat heavily marked, and has the veins accentuated with black. In many other female specimens (probably of the dry season), and in all the males with which I am acquainted, the black veining is absent from the upper surface. In *P. simana*, on the other hand, although the females vary in this respect, probably, like those of *P. venata*, according to season, the males appear always to have the veins on the upper surface more or less marked out with black. On these and other grounds presently to be mentioned, I think that *simana* and *venata*, though no doubt closely allied, are separable as subspecies.

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* Enc. Méth., ix, p. 123, n. 15.

† Sp. Gén., I, p. 527, n. 130 (1836).

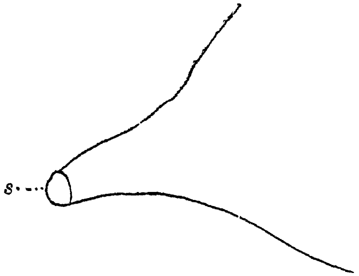

FIG. 3.—*P. liliana*, Gr. Smith. Spine of clasper × 54.

It may then be said, at least provisionally, that there are four, or perhaps five, subspecies which can be ranked under the head of *Pinacopteryx charina*. It will be of interest to see what light can be thrown on the mutual relations of these forms by an examination of structural details.

(1) *The Male Genitalia.*—As already remarked, the clasper in all these forms ends posteriorly in a single spinous projection. This in a specimen of *P. liliana* from Mombasa is long and slender (fig. 3). In an example of

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* Trans. Ent. Soc. Lond., 1913, Pl. II, figs. 1, 2, 3.

† *Reise nach Mossambique*, Taf. XXIII, figs. 3–6.

P. charina from Weenen, Natal (fig. 2), it is also long, but markedly less so than in *P. liliana.* The terminal spine in a *P. simana* from Gazaland (fig. 4) and a *P. venata* from Gondokoro, White Nile (fig. 5), is short; it is somewhat blunter in *simana* than in *venata.* A point to be noted is that, judging from these examples, the clasper of *charina,* a comparatively small form, is not much less in size than that of *liliana,* decidedly a larger insect. The claspers of *simana* and *venata* are much smaller. In all four forms the terminal spine is furnished at its free extremity with a socket from which proceeds a group of chitinous bristles. These are not represented in the figures. The socket is indicated at *s.*

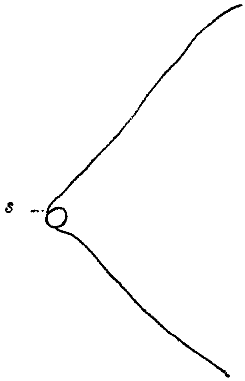

FIG. 4.—*P. simana,* Hopff. Spine of clasper × 54.

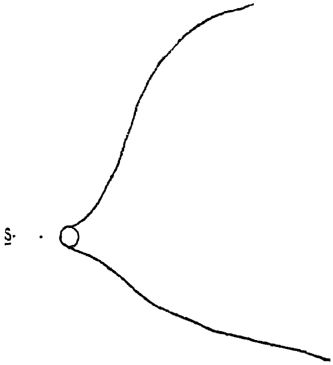

FIG. 5.—*P. venata,* Butl. Spine of clasper × 54.

There is also a difference to be observed between the two sections of *Pinacopteryx,* in reference to the character of the uncus. This structure in the *charina* group is comparatively slender, and rather sharply pointed. The dorsal margin is slightly sinuous in outline, and the distal portion of the uncus is curved downwards, sometimes so decidedly as to give the organ almost a sickle-shaped character (fig. 7). In the *pigea* group, on the other hand, the dorsoventral dimension is proportionately greater, the free extremity is comparatively blunt, the dorsal margin is uniformly convex, and the curve of the organ, though present, is less pronounced (fig. 6).

(2) *The Scent-scales.*—These, as elsewhere noted, present

in all the forms the general appearance of an elongated lamina with rounded base and parallel sides. In specimens of *P. liliana* from Mombasa, Taveta, the Dabida Hills, Thiba River and near Machakos, the rounded base is

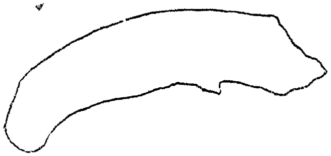

Fig. 6.—*P. pigea*, Boisd. Uncus × 54.

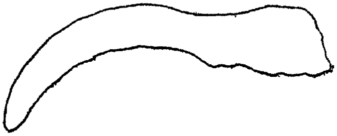

Fig. 7.—*P. gerda*, Gr. Sm. and Kirb. Uncus × 54.

greatly expanded and takes up by far the greater part of the area of the lamina. The outline of the scale thus becomes flask-shaped, the neck of the flask being represented by the portion of the lamina distal to the basal expansion (fig. 8). The scent-scales of a male specimen from Mombasa which corresponds with the description and figure of *P. gerda* by Grose Smith and Kirby, exhibit precisely the same characters as the foregoing. This appears to favour the impression that the only difference between *gerda* and *liliana* is one of season. The specimens above referred to (p. 193) from the Voi River and Mlegwa closely resemble in aspect the "*gerda*" from Mombasa; their scent-scales, however, present a different appearance, the basal expansion being much reduced (fig. 9). So far as outline goes, they are much like the corresponding structures in *P. simana*, but they possess one character in common with *P. liliana* which is not shared by *simana*; and which, in conjunction with another feature presently to be mentioned, seems to indicate

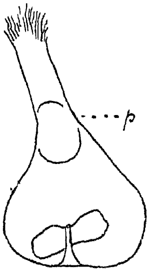

Fig. 8.—*P. liliana*, Gr. Sm. Scent-scale × 310. *p*, granular patch.

that these Voi River specimens may be regarded as a slightly divergent form of *P. liliana.* Whether Smith and Kirby's name of *gerda* may properly be applied to them is perhaps open to question. The character of the scent-scale just alluded to is the occurrence, at or near the junction of the neck with the body of the flask, of a rough-looking granular patch, dark by transmitted light, most conspicuous in *liliana* from Mombasa, but easily recognisable in the *gerda*-like specimens above mentioned (figs. 8, 9, *p*). This appearance is not seen in the scent-scales of *charina*, *simana* or *venata*; a diffused shading, but no definite granular patch, being the nearest approach visible in the corresponding situation.

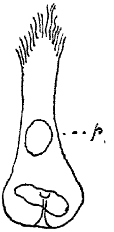

FIG. 9.—*P. gerda*, Gr. Sm. and Kirb. Scent-scale × 310. *p*, granular patch.

When I first investigated the scent-scales in this group, working with somewhat limited material, I formed the opinion that *P. venata* could be easily distinguished from *P. simana* by the shorter and broader character of its scent-scales.* This was the case with the specimens from which my preparations were made; but the examination of additional examples has shown that the distinction does not universally hold good. It occasionally, though rarely, happens that a scent-scale from an undoubted specimen of *P. venata* (as in one from Hagarat in South Kordofan) is as long as an exceptionally short scale from *P. simana*; and similarly, a scale here and there from *P. venata* (as

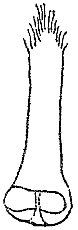
Fig. 10.

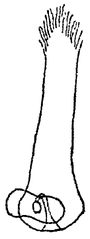
Fig. 11.

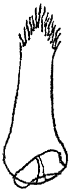
Fig. 12.

FIG. 10.—*P. charina*, Boisd. Scent-scale × 310.
FIG. 11.—*P. simana*, Hopff. Scent-scale × 310.
FIG. 12.—*P. venata*, Butl. Scent-scale × 310.

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* Proc. Ent. Soc. Lond., 1912, p. cxiii.

in a specimen from Gondokoro on the White Nile) is narrower in proportion than the usual scale of *P. simana.* But there is no doubt that a comparison of the average dimensions of the scent-scales in the two forms shows the distinction above stated. The scent-scale in *P. charina* is much like that in *P. simana,* but here again it is on the average shorter, though not so short as that of *P. venata* (figs. 10, 11, 12).

It was mentioned on p. 196 that in addition to the dark granular patch of the scent-scale, there was another feature which would seem to indicate that the Voi River and Mlegwa specimens are a form of *liliana* rather than of *simana.* This is the presence of a well-marked dark spot on the upper surface of the fore-wing of the female, situated between the median and submedian veins and usually extending into the space below the submedian. The spot in question is characteristic of the wet-season and intermediate females of *liliana,* including the "*gerda*" form from Mlegwa and the Voi River, but appears to be always absent, or at most only represented by a very slight powdering of dark scales, in the females of *charina, simana* and *venata.* Judged by this criterion, as well as by the evidence of the scent-scales, there appears to be no doubt that the "*gerda*" forms are rightly associated with *liliana* and not with *simana.*

It may be well here to recapitulate in some detail the chief points that call for notice in regard to these several forms.

(1) *P. charina,* Boisd.—This is the form which is found in Cape Colony, Natal, Zululand, and (probably) the Transvaal. Both males and females are without black veining. The male is nearly always without any discocellular spot on the upper surface, but possesses one on the lower surface of the hind-wing, and occasionally of the fore-wing; the latter, if present, being minute. On the upper surface of the fore-wing of the female the discocellular spot may be present or absent; it appears to be always absent from the hind-wing. Beneath, in the female, it is constantly present in the hind-wing and often visible on the fore-wing as well. The upper surface of the male may be entirely immaculate; but on the fore-wing there is usually a dark streak bounding the costa, and a marginal series of dots on the hind border, which are often discrete, but may be merged into a dark band

never very broad. A similar marginal band in the female is usually broader and better marked, but may be almost obsolete. The female has a chain of subapical spots on the fore-wing, reaching from the costa to the space below the first radial branch; a larger spot occupies the space between the second and third median; this is usually isolated, but a minute spot sometimes occurs below the second radial, completing the chain. Both sexes show a pearly lustre at the base of the wings on the upper surface; this extends over a larger area in the female than in the male. The under surface of the hind-wing and apical area of the fore-wing are pale yellow, marked in the dry-season form of both sexes with a rich irroration of dark specks or blotches; the submarginal spots of the female are visible beneath, being more or less assimilated to the irroration. The male has occasionally on the underside an indication of the costal end of a corresponding submarginal chain; but from this sex the spot between the second and third branches of the median is nearly always absent, though it may be present in the wet-season form as a small dot. In the wet season also the irroration becomes reduced to a series of small submarginal spots, sometimes very faintly marked. In both sexes the veins of the hind-wings on the upper surface and both wings of the lower surface may possess minute marginal dark dots. These may be present at all seasons. The male clasper in a specimen from Natal is larger than in *P. simana* and *P. venata*; it resembles that of *P. liliana* in size and in the length of the single posterior spine (fig. 2), which is nearly as long as in that subspecies. The uncus (fig. 13) is small relatively to the size of the clasper. The lamina of the scent-scale has parallel sides and an expanded and rounded base. In size it is intermediate between those of *P. simana* and *P. venata*.

(2) *P. simana*, Hopff.—This is the form found in Portuguese and German East Africa, Rhodesia, British Central Africa, Uganda and British East Africa with the exception of the coast region about Mombasa, where it is replaced by *P. liliana* and *P. gerda*. In this subspecies the male is invariably veined on the upper surface, more distinctly so in the wet than in the dry season. In both sexes the dark border of the fore-wing is continuous, showing little tendency to break up, as in *charina*, into a series of marginal spots. In both wet- and dry-season phases of the female

there is a strong tendency for the apical portion of the dark border to fuse with the submarginal series of dark spots, thus forming a well-marked apical patch. A small discocellular spot may be present on the fore-wing of the male, especially in specimens from west of Lake Victoria Nyanza, but only in rare instances on the hind-wing. A similar discocellular spot is always present on the fore-wing of the female, and in the wet-season form on the hind-wing as well. Very rarely there may be in the female a slight indication of a dark spot in the space between the median and submedian veins of the fore-wing; this is shown in the figure of the type in Peters' *Reise.** Beneath, the general surface of both wings in the wet-season male is white with more or less dark veining; this veining in a series of males from west of the Victoria Nyanza is extremely well marked, especially on the hind-wing. A submarginal series of spots is more or less visible on both fore- and hind-wing. These in the series last referred to are highly developed, and are frequently united into a conspicuous submarginal band, which, however, in the fore-wing does not extend further backward than the space between the second and third median branches. The discocellular spots are always present on both fore- and hind-wings. The underside of the wet-season female varies a good deal according to locality. The hind-wing and apex of fore-wing are usually yellow; the remainder of the fore-wing, white. The submarginal spot between the second and third median is always conspicuous, the rest of the submarginal series may disappear. There is, however, nearly always a submarginal chain visible on the hind-wing, and in females from west of the Victoria Nyanza the submarginal band is as well developed on both wings as that of the males from the same region. The discocellular spots are always present, as in the male. In the dry season the hind-wing and apical area of the fore-wing in both sexes become overspread by a brownish irroration, with which the dark markings become assimilated. The powdering is usually more blurred and of a paler brown than in *charina*; the discocellular spots, as above noted, are present in both sexes. The clasper in a male from Gazaland is small; its posterior spine (fig. 4) is blunt, not prolonged as in

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* *Reise nach Mossambique,* Taf. XXIII, figs. 5, 6.

charina. The uncus (fig. 14) is abruptly curved at its distal end. It bears some resemblance in outline to the upper mandible of the beak of a gull. The scent-scale (fig. 11) is like that of *charina*, but generally longer.

(3) *P. liliana*, Grose Smith.—This is a well-marked subspecies from Mombasa and the adjacent region, including Taveta and Machakos. It is on the average considerably larger than any of the other forms of the *charina* group. The wet-season male is veined with black on the upper surface, and is somewhat heavily marked with grey on the inner half of the costa of the fore-wing and the base of both wings. The apex and posterior margin of the fore-wing are margined with black. There are no discocellular spots on either wing. The wet-season female may be either white or yellow on the upper surface; it has a broad dark border to the fore-wing, with which the costal part of a submarginal chain is usually merged. The hind-wing is bordered by a series of large dark spots, sometimes fused together. The submarginal spot between the second and third median branches is very large and conspicuous; and there is always visible a spot, belonging to the same series, in the space between the median and submedian, usually passing the boundary of the latter vein. A submarginal band or row of spots is sometimes visible on the hind-wing. A discocellular spot is always present on the fore-wing, and usually on the hind-wing also. Beneath, the wet-season male is white with small dark marginal dots and a chain of submarginal brownish spots, more or less developed, on both fore- and hind-wings. Discocellular spots are present on both wings, and there is a large and conspicuous submarginal spot between the second and third median

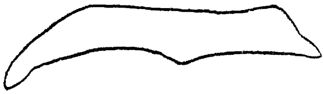

Fig. 13.—*P. charina*, Boisd.
Uncus × 54.

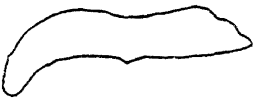

Fig. 14 —*P. simana*, Hopff.
Uncus × 54.

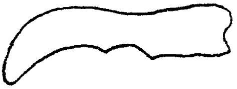

Fig. 15.—*P. venata*, Butl. Uncus × 54.

branches, occupying the same position as in the female. In the wet-season female the costa and apex of the fore-wing and the whole of the hind-wing are usually yellowish beneath. The submarginal chain of spots is present on both wings; the spot on the fore-wing between the second and third median being large and conspicuous, as on the upper surface. Discocellular spots are present on both wings. In the dry season the male may show above little or no trace of dark veining. The dark markings of the female are also much reduced, but the large spot between the second and third median branches is still present and conspicuous on the fore-wing; the hind-wing may be spotless, though there is usually a marginal series of dark spots. A discocellular spot is generally present on the fore-wing, but not on the hind-wing. Beneath, the male may be spotless but for the large median spot, which persists. The female often shows a slight mottling on the hind-wing and apex of the fore-wing, to which the submarginal spots are assimilated. This mottling is comparatively pale, and the powdering specks are usually more sparsely distributed than in most specimens of *P. charina*. Discocellular spots are present on both wings, but may be very faint. The clasper in a male from Mombasa is large, like that of *P. charina*; and ends posteriorly in a long spur (fig. 3), still longer than the corresponding structure in that subspecies. The clasper of another Mombasa specimen, which corresponds in appearance with Grose Smith and Kirby's *P. gerda*, is of the same *liliana* character, but with a somewhat shorter spine (fig. 16). The uncus of the first-named Mombasa specimen (fig. 17)

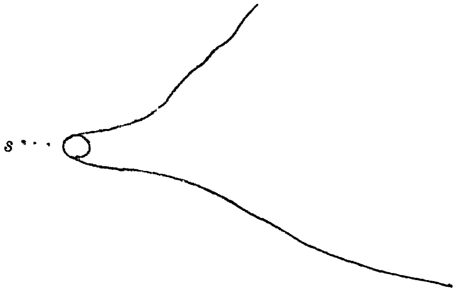

FIG. 16.—*P. liliana*, Gr. Smith. Spine of clasper × 54.

is long and slender, shaped like a surgeon's curved bistoury. That of the *gerda*-like specimen (fig. 18) is of similar character, but slightly sharper at the tip. The scent-scale is of the remarkable shape described on p. 196, and is characterised by the presence of a dark granular patch at the junction of the narrow portion of the lamina with its expanded base (fig. 8, *p*).

(4) *P. gerda*, Grose Smith and Kirby.—The type described and figured under this name,* from Mombasa, is probably a dry-season male of *P. liliana*; but there is a form, as already mentioned, occurring at Voi, Mlegwa and Maranga (all in British East Africa), the male of which is identical in appearance with *gerda* as figured and described, and to which the same name may perhaps be applied, at all events provisionally. The upperside of the male in this form appears to be always free from dark veining, and the dark margin of the fore-wing is somewhat further prolonged towards the anal angle than in *P. liliana* ♂. There is usually an indication of a discocellular spot on the fore-wing, but not on the hind-wing. Beneath, the general surface of both wings may be white, as in a specimen from Mlegwa (January) and one from Voi (May); or the hind-wing and apex of fore-wing may be yellow; pale, as in another specimen from Voi (May), or deeper, as in two from Voi (October). The discocellular spots are present on both wings, but very faint on the hind-wing in both

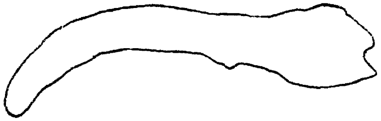

FIG. 17.—*P. liliana*, Gr. Smith. Uncus × 54.

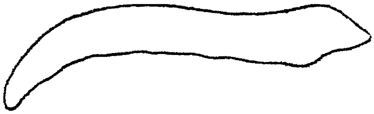

FIG. 18.—*P. liliana*, Gr. Smith. Uncus × 54.

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* Rhop. Exot., *Pinacopteryx*, Pl. I, figs. 10, 11.

specimens captured in October. The large median spot is always present, and there may be an indication of a submarginal series on the hind-wing. The female is like a wet-season or intermediate female of *P. liliana*, though usually smaller. It always possesses on both surfaces the spot between the median and submedian of the fore-wing, as in those forms, and the discocellular spots on fore- and hind-wing. The claspers in a male from Voi (figs. 19, 20) are curiously unsymmetrical; the right valve ending posteriorly in a sharp spine like that of *liliana* from Mombasa, and furnished, as in that form, with a terminal socket from which protrudes a group of large chitinous bristles; the left valve also ends in a spine, but this, besides being shorter and broader, is entirely destitute of a terminal socket. The uncus of the same specimen (fig. 7), though like that of *P. liliana*, is more deeply curved. It may be

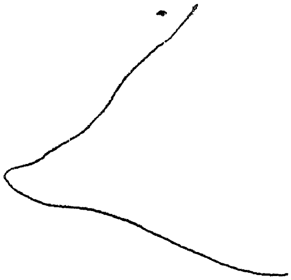


FIG. 19.—*P. gerda*, Gr. Sm. and Kirb. Spine of left clasper × 54.

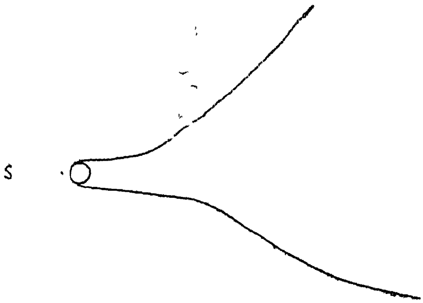


FIG. 20.—*P. gerda*, Gr. Sm. and Kirb. Spine of right clasper × 54.

called sickle-shaped. The scent-scales in two males from the Voi River (fig. 9) and one from Mlegwa are of the *liliana* rather than of the *simana* type. The basal expansion takes up more of the lamina and is more rounded than in *simana*, but is much smaller and less rounded than in *liliana*. Like the corresponding structure in the latter form, the lamina shows a dark, granular, circular or oval patch at the junction of neck with body (fig. 9, *p*).

(5) *P. venata*, Butl.—This is the form which is found in the White Nile region, Abyssinia (Lake Rudolph Expedition), Southern Kordofan and the Southern Sûdân at least as far west as the Shari-Tchad Protectorate. It is generally smaller than *P. simana*, and, especially in the dry season, is sharper-winged in both sexes than that insect. The upper surface of the male differs also from that of *P. simana* in showing no dark veining; it may possess in the wet season a few black scales in the situation of the discocellular spot of the fore-wing, but is generally destitute of all traces of these spots except a slight discoloration showing through from beneath. The fore-wing possesses a dark apical patch passing into a hind-marginal band; this patch and band in the dry season may become pale and may almost disappear. There is also on the hind-wing a row of marginal spots, often absent in the dry season. Beneath, the male is white; in the wet season the submarginal series is very often absent, but may be indicated by a more or less complete chain of dark spots. In the dry season the submarginal chain is usually better developed; it is paler in colour, and on the hind-wing frequently forms a festooned linear band. A slightly-marked brownish irroration may be present on the hind-wing and the apex of the fore-wing. There is generally some dark veining on the apex of the fore-wing and outer portion of the hind-wing at both wet and dry seasons. The discocellular spots are always present; a marginal row may also occur, especially in the wet season. On the upper surface of the female the dark apical patch is broader than in the male; as in that sex, it passes into a continuous hind-marginal band, darker and more pronounced in the wet season than in the dry.. In the wet season the dark veining of both wings is usually well marked, as in Mr. Butler's type; the hind-wing also carries a series of large dark marginal spots. The submarginal chain of the

fore-wing ends in a large spot between the second and third median branches; there is no spot below the median, such as occurs in *P. liliana*. A discocellular spot is present on both wings in the wet season; in the dry season it is often absent from the hind-wing, and sometimes from both. Beneath, the hind-wing and apex of the fore-wing are yellow, varying in degree of intensity; the remaining area of the fore-wing is white, often with a yellowish shade at the base. The veins of the hind-wing and of the apex of the fore-wing are marked with dark lines, paler in the dry season; at which period the same areas may also show a slight reddish-brown irroration. Except in the extreme dry-season form, a marginal row of spots is generally to be found on the hind-wing. The submarginal series of spots is usually present at both seasons, on the hind-wing taking the form of a more or less continuous festooned line; on the fore-wing it may be very slightly developed, but always includes the characteristic spot between the second and third median. As on the upper surface, there is no spot posterior to the median. Discocellular spots appear to be always present on both wings. It may be observed that the dry-season specimens from the White Nile are sharper-winged than the generality of examples from Kordofan, and are also more conspicuously marked. It is especially noticeable in the latter assemblage that all the markings of the female on both surfaces are in the dry season of the same reddish-sandy tint. In the wet season the corresponding markings are dark brown or black. The clasper of a male from Gondokoro ends posteriorly in a spine (fig. 5) which is much blunter than that of *P. charina*, *liliana* or *gerda*, but is slightly less blunt than that of a *P. simana* from Gazaland. The uncus (fig. 15) is like that of *P. simana*, but is still more sharply bent downwards at the tip. The scent-scale (fig. 12) is somewhat variable; but on the average is shorter, and broader in proportion than that of *P. simana*, which it otherwise resembles.

P. simana and *P. venata* are no doubt closely related, though typical specimens are easily distinguished. They may perhaps intergrade in Uganda.

The chief points of distinction between *Pinacopteryx* of the *charina* group may be summarised in tabular form as follows:—

	Distribution.	Dark venation (♂)	Submedian Spot.	Spine of Clasper.	Uncus.	Scent-scale. Average length of lamina.
P. charina, Boisd.	Cape Colony, Natal, Zululand, Transvaal.	Absent.	Absent.	Long.	Moderately long; slightly curved.	0·086 mm.
P. simana, Hopff.	Portuguese and "German" East Africa, Rhodesia, British Central and East Africa (except the neighbourhood of Mombasa), Uganda.	Present.	Rarely a faint indication in ♀.	Short; very blunt.	Short; sharply curved.	0·098 ,,
P. liliana, Grose Smith.	Mombasa and neighbourhood.	Present in ⊗. Absent in ♂.	Present in ⊗ and ⊖.	Long.	Long; slightly curved.	0·115 ,,
P. gerda, Grose Smith and Kirby.	Voi River, Maranga, Mlegwa (Br. E. Africa).	Absent.	Present in ♀.	Long.	Long; sharply curved.	0·092 ,,
P. venata, Butl.	White Nile, Abyssinia, Southern Kordofan, Southern Sûdân.	Absent.	Absent.	Short; blunt.	Short; sharply curved.	0·076 ,,

Before closing this paper, I should wish to say that I am far from supposing that the statements and conclusions therein contained are necessarily final. It is quite possible that a more minute examination of existing specimens, or an accession of fresh collections from the above and other districts, might render necessary a modification of the present results. I can only claim to have done my best with the material at my command; this comprises the series in the National Collection at the British Museum and the Hope Collection at Oxford, the latter containing the very valuable consignments from Capt. R. S. Wilson (Southern Kordofan), Mr. W. S. Loat and Dr. G. B. Longstaff (White Nile), the Rev. K. St. A. Rogers (British East Africa), Mr. C. A. Wiggins (Uganda), Dr. G. D. H. Carpenter ("German" East Africa), Mr. S. A. Neave (Rhodesia), Dr. Longstaff and Mr. G. A. K. Marshall (Cape Colony, Natal, Gazaland and Mashonaland), with others. The care taken by all these gentlemen to furnish their specimens with exact and ample data as to locality and time of capture calls for grateful recognition on the part of those to whom belongs the task of working out and co-ordinating the material provided by their several collections. It is impossible to overestimate the value, for bionomic purposes, of accurate notes of this description.

To Dr. Eltringham I am indebted for the preparation of a long series of genitalia, from which most of the outline figures which accompany this paper have been drawn. My special thanks are due to him for this and other help which has always been most cordially given.

TRANSACTIONS
OF THE
ENTOMOLOGICAL SOCIETY
OF
LONDON
FOR THE YEAR 1915.

I. *New Species and Subspecies of* Pierinae. By F. A. DIXEY, M.A., M.D., F.R.S., Fellow of Wadham College, Oxford.

[Read May 6th, 1914.]

PLATES I, II.

THE following forms, some of which appear to be of specific and others of subspecific rank, have been presented at various times to the Hope Collection at Oxford. The types in every case are in the Hope Collection.

1. **Teracolus rogersi**, sp. n. (Plate I, figs. 1–4.)

♂. Exp. al. 35 mm. *Upperside* creamy white; fore-wings with a deep orange apical patch, separated from the rest of the wing by a nearly straight narrow dark band with blurred edges; this band leaves the costa at a point just opposite the outer termination of the cell, and reaches the hind margin at the termination of the first branch of the median vein. Costa and hind margin with a black border, broadened from the termination of the third subcostal to that of the first median vein, elsewhere narrow. The veins within the apical orange patch are black, and the dark broadened border is prolonged inwardly upon them for a short distance. There is a minute black spot at the apex of the re-entrant angle at the outer end of the cell, and a small black patch at the base of the wing, somewhat prolonged along the inner margin. Fringe darkish opposite the apical patch; elsewhere pale. Hind-wings narrowly bordered with black, a blackish patch at the marginal termination of each branch of the median, of the radial, and of the two subcostal veins, the latter three patches being more or less fused together. A minute blackish streak, representing a submarginal spot, near the border; running between, and parallel with, the third median and radial veins. Base of the wing with a blackish patch, rather larger and more diffused than that of the fore-wing. Fringe pale.

Underside. Fore-wings white; the apical area, which corresponds in size with that on the upper surface, divided into an outer ochreous and inner pale orange band by a series of four minute dusky spots, elongated in a direction parallel with the veins. Discoidal spot somewhat larger and more distinct than on the upper surface. Hind-wings reddish ochreous with a slight dusky clouding in the precostal space, along the posterior half of the cell, and between the median and submedian veins. A bright orange-yellow streak along the costa, and a submarginal series of six diffused dusky spots, each occupying one of the interspaces from the costal to the second median; of these the first (in the costal interspace) is the largest, and the third (in the second subcostal interspace) is almost obsolete. A small squared black spot at the re-entrant angle terminating the cell, bounded internally by a slight diffusion of orange-yellow.

♀. Exp. al. 36–39 mm. *Upperside* pale creamy white; fore-wings with an orange apical patch of nearly the same shade and relative size as in the male. This patch is separated from the rest of the wing by an irregular dark bar, narrow in the middle of its course, but expanding anteriorly into a triangular blotch with its base resting on the costa, and posteriorly becoming fused with a curved submarginal band of dark spots, increasing in size from before backwards, and traversing the middle of the orange patch from the second subcostal to the second median interspace. The costa as far as the apical patch is narrowly bordered with grey, the patch itself is bounded anteriorly and posteriorly with black, the black posterior margin being much thicker than in the male, and less markedly prolonged along the veins, but being similarly narrowed as it leaves the patch and approaches the anal angle. As in the male, the veins crossing the apical patch are black. The black discoidal spots are larger and more conspicuous than in the male; the base of the wings shows a greyish diffusion, and a well-marked dark grey bar runs in the median and submedian interspaces, parallel with the inner border, and ending near the anal angle in a fairly definite dark patch which appears to be in series with the submarginal spots. The fringes are pale reddish, taking a darker tinge in the region of the apical patch. Hind-wings narrowly bordered with black, a marginal row of dark spots as in the male, the anterior three being fused into a marginal band; a submarginal series of dark spots occupying the interspaces, that in the radial interspace (between the radial and third median veins) being the largest and darkest. The base shows a greyish clouding, which is slightly prolonged towards the anal angle. A minute black discoidal spot present. Fringes pale reddish.

Underside. Fore-wings white; inner four-fifths of cell washed with pale lemon-yellow. Apical patch divided by a row of dark submarginal spots, corresponding to those on the upper side but more discrete, into an outer reddish-ochreous and inner orange-ochreous portion, the contrast between the two tints being much less marked than in the male. The black discoidal spot is not larger than on the upper surface. A pale greyish bar runs parallel with and close to the inner border, ending near the anal angle in a fairly definite dark patch. Hind-wings as in the male, but slightly darker and with a somewhat more pronounced dusky suffusion. The submarginal spots are much larger than in the male. The discoidal dot is very slightly touched with orange. There is an orange streak along the costa, and a pale Indian-red patch at the origin of the median vein.

In both sexes the row of submarginal spots in the median and submedian interspaces of the hind-wing (in the male visible only on the under surface) conforms more nearly to the curved margin of the wing than is usual in this group of *Teracolus.*

1 ♂, 3 ♀♀ (Taveta), in Hope Collection, Oxford. The male and one of the females were bred by the Rev. K. St. A. Rogers, emerging on August 6, 1905. A second female was captured on August 7, 1905, and a third female on July 16, 1910, both by Mr. Rogers.

The species may be an East African representative of *T. halyattes,* Butl., the type of which came from Natal. *T. halyattes* is regarded by Butler as the dry-season phase of his *Teracolus lais,* the type of which also came from South Africa. The representative of *T. lais* in the Nile district is doubtless *T. ephyia,* Klug, and the present form, intermediate between *T. lais* and *T. ephyia* in geographical position, is in some respects intermediate also in character. One feature that serves to distinguish it from the type of *T. halyattes* is that the submarginal series of spots on the hind-wing tends to form a curve more or less conformable to that of the wing-margin, whereas in *T. halyattes,* as generally in members of the *achine* group of *Teracolus*, the submarginal series of the hind-wing is sharply bent to a right angle at the level of the third median branch. In those specimens that I have examined, the males of *T. lais* and *T. rogersi* can be distinguished by their plume-scales. These are nearly of the same size in the two forms, but in *T. lais* the sides of the lamina proximally to the apex are almost parallel, whereas in *T. rogersi* they tend to converge towards the spring of the fimbriae. The plume-scales of *T. ephyia* have their sides usually parallel, as in *T. lais*, but they are smaller, and generally much narrower in proportion to their length.

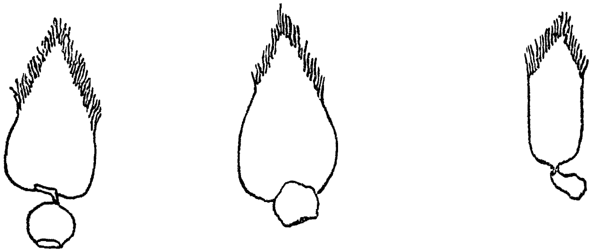


FIG. 1. *T. lais*, Butl. × 310.   FIG. 2. *T. rogersi*, n.sp. × 310.   FIG. 3. *T. ephyia*, Klug. × 310.

SCENT-SCALES.

2. **Belenois victoria, sp. n.** (Plate II, figs. 5–8.)

♂. Exp. al. 55 mm. *Upperside* white; a slight greyish dusting close to the body. Costa of the fore-wing very narrowly edged with black. A black apical patch, continued as an irregular black border along the hind margin. The irregularity of the border is chiefly due to a marked projection inwards between the second and third median branches, the border at this point filling about the outer two-fifths of the interspace indicated. The marginal ends of the first median branch and of the submedian vein are marked by black spots, prolonged for a short distance inwards. The former of these spots is large, and fuses with the black border. The latter spot is smaller and may remain distinct, or may be connected with the dark border by an intermediate dusting of grey. At the outer end of the cell is a large roundish black spot, covering the second discocellular vein. This spot may be entirely isolated, or may be connected with the dark edging of the costa by a dusky curved band, more or less developed, following the outer and anterior margin of the cell, and so having its concavity directed towards the root of the wing. Some or all of the interspaces between the veins which traverse the dark apex and hind border are marked by a powdering of white scales, generally very indistinct, but in the space between the fourth subcostal branch and the first radial vein assuming the appearance of a definite white spot. The hind-wing may be entirely immaculate, or may have the marginal ends of the veins marked with black points.

Underside. Fore-wing white; the costa slightly edged with greyish yellow. Apical patch, corresponding in extent with that of the upper surface, of the same greyish yellow, bordered inwardly with a slightly festooned streak of pale fawn-colour. A dark spot more or less developed, in the second median interspace, corresponds in position with the inward projection of the dark hind border above. The spot on the second discocellular vein corresponds with that on the upper surface, but is of a less intense black; there may or may not be a trace of the curved dusky band connecting it with the costa. In some specimens there is a slight yellow shade at the root of the wing.

The hind-wing is of a greyish yellow like the apex of the fore-wing. There is a streak of vivid orange along the whole length of the costa, broadest near the body, and reaching as far as the marginal end of the first subcostal branch; a short streak of the same colour occupies the root of the interspace between the median and submedian veins. The remaining marks are of the same pale fawn-colour as that bordering the apical patch of the fore-wing. They consist of a slight accentuation of the veins with their branches, broadening into a patch on the second discocellular, and including the vestigial vein between the median and submedian and that within the cell; including also a patch between the origins of the first and second median branches and another patch adjoining it internally; a series of submarginal spots in the interspaces, those from the second subcostal to the submedian vein taking an arrow-head form with the points directed inwards; and, finally, a series of linear spots at the marginal ends of the veins and their branches, parallel with the margin, and occasionally fused into a narrow marginal band.

♀. Exp. al. 53 mm. *Upperside.* Fore-wing white; hind-wing varies from white through primrose yellow to deep yellow ochre. Dark markings as in the male, but more pronounced. Fore-wing, costal edging broader, apical black continued along hind margin as far as anal angle; no separate marginal spots; no white dusting in interspaces; the black spot on the second discocellular joined to the costa by a broad dusky band which may occupy the anterior half of the cell. Marginal spots of the hind-wing much larger than in the male.

Underside as in the male, but with a conspicuous orange flush at the base of the fore-wing, extending over the proximal two-thirds of the cell, and showing faintly through on the upper surface.

29 ♂♂, 4 ♀♀ (Tiriki, Victoria Nyanza; and Toro, W. Uganda), in the Hope Collection, Oxford.

Fourteen of the males and all four females were captured by Mr. C. A. Wiggins in the Tiriki Hills, N.E. of the Victoria Lake, during February and March 1903. Fifteen males (also presented by Mr. Wiggins) were taken by native collectors in the Toro country, on the eastern slopes of Ruwenzori, in November and December 1900. These are all recorded by Mr. S. A. Neave, under the head of *Belenois zochalia* f. *formosa*, Butl., in Novitat. Zoolog. vol. xi, 1904, p. 358.

This is a very distinct form of the *Belenois zochalia* group. It is easily distinguished from *crawshayi*, Butl., *tanganyikae*, Lanz (*formosa*, Butl.), and *diminuta*, Butl., by the darker apex and border of the fore-wing, from which the white spots have almost disappeared in the male and have entirely vanished in the female; the nearly immaculate white or yellow of the hind-wing; but especially by two features of the under surface, viz. the great prolongation of the orange costal streak, and the general character of the dark markings on the hind-wing. In the other forms of the *B. zochalia* group, these latter markings are linear, looking as if they had been drawn with a pencil or stiff brush. When they become faint or disappear, as in *B. diminuta*, they do so by attenuation and curtailment. In *B. victoria* they look as if they were made with a soft brush, and they become faint by gradually melting, without diminution of size, into the ground-colour of the wing.

In the National Collection there are three males of this form, two from Mount Elgon and one from Toro. They are ranked as *B. formosa*, but differ in the points stated from the type of *formosa* beside them.

Among the African forms of the genus *Nychitona*, Butl., (*Leptosia*, Auriv.), there is a race or subspecies first known to me by four specimens from the region of the Victoria Nyanza, presented to the Hope Collection by Mr. C. A. Wiggins. The series consists of two males from the Toro country on the eastern slopes of Ruwenzori, captured by natives in November or December 1900; and two females, one captured by Mr. Wiggins at Entebbe on the N.W. shore of the lake on April 8, 1903, and the other caught by a native in the Ugaia country, south of the Kavirondo gulf, in January 1903. These specimens differ in some respects from all forms of *Nychitona* hitherto described, but may be considered as a subspecies of *N. medusa*, Cram.

3. **Nychitona wigginsi**, subsp. n. (Plate III, figs. 9–12.)

♂. Exp. al. 46 mm. *Upperside* dead, opaque white, with a very faint greenish-yellow tinge; not semi-translucent as in some other forms of *Nychitona*. Fore-wings with slight fuscous mottling along the costa, reaching from the body to a point opposite the origin of the first branch of the subcostal. A dark fuscous apical crescentic patch, slightly waved on its inner aspect but not indented as in most other forms of *Nychitona*, beginning at a point on the costa nearly opposite the origin of the second subcostal branch, and ending on the hind margin in the interspace between the first and second median branches. Hind-wings bordered with a very narrow dark line, the centre of each interspace marked on the border by a minute dark spot. There is no other marking on the upper surface of either fore or hind-wing, but the mottling of the under surface shows faintly through.

Underside white; a dull green mottling filling the basal half of the cell, and prolonged on the costa as far as the termination of the first subcostal branch. A similar mottling on the apical area corresponds to the dark crescentic patch on the upper surface, and is also found over the whole of the hind-wing. This mottling of the hind-wing is scattered generally over the surface of the wing, and shows little or no tendency to fall into the parallel streaks which are conspicuous in some other forms of *Nychitona*.

♀. Closely resembles the male in size and aspect. In both sexes the tint and texture of the upper surface give an aspect which is conspicuously different from that of other forms of *Nychitona*.

The marked resemblance of this form to the curious *Leuceronia pharis*, Boisd., which also occurs in the Ugaia country, and probably in the Toro district, was commented on by me in Trans. Ent. Soc. Lond., 1908, p. 569. I may here be allowed to mention that the statements there made had reference to the present form of *Nychitona* only, and not, as has been supposed, to other forms, such as that named *immaculata* by Aurivillius, more or less closely resembling it.

4. **Hesperocharis longstaffi**, subsp. n. (Plate II, figs. 1–4.)

♂. Exp. al. 52 mm. *Upperside.* Fore-wings very pale chrome yellow, passing gradually into pale ochreous at the apex. Fuscous scales form a very narrow edging to the costa, and are collected about the marginal terminations of the subcostal and median branches, and of both radial veins, appearing in this situation as a series of small ill-defined triangular spots, fused at the apex of the wing by their bases, and diminishing in size along the posterior border; a fuscous line, belonging partly to the fringe, extends from the apex to the termination of the first median branch. Hind-wing, pale ochreous like the apex of the fore-wing, becoming lighter towards the costa and deepening slightly towards the hind and inner margin. Anal angle somewhat prolonged.

Underside. Fore-wings dead white; apex pronounced yellow ochre. A very slight fuscous edging to the outer two-thirds of the costa, prolonged for a short distance round the apex. A small, ill-defined fuscous spot on the costa, just proximal to the origin of the second branch of the subcostal. Hind-wings, rich yellow ochre, deepening on the costa, which is narrowly edged with fuscous throughout its whole extent except a very small portion near the body. A series of four fuscous spots runs almost parallel with the costal and hind margin, the first two actually on the costa, the third barely touching it, and the fourth a little distance inwards from the hind border. These spots, which have a purplish tinge from contrast with the general yellow of the wing, are situated respectively on each side of the costal vein, in the interspace between the two branches of the subcostal, and in that between the lower subcostal and radial. The first two are the most intense in colour, the fourth distinctly fainter, the second and third are the largest. There is a fifth spot, similar to the fourth of the preceding series, but smaller, just internal to the origin of the first median branch. The ventral part of the thorax shares in the rich ochreous colour of the hind-wings.

♀. Exp. al. 60 mm. (Another ♀ in Coll. Hope, 57 mm.) *Upperside* of both wings a bright canary yellow, somewhat deeper on the hind-wing and at the apex of the fore-wing. A narrow fuscous edging and apical spots as in the male. *Underside* as in the male except that the dead white of the fore-wing is replaced by canary yellow, and that the fuscous spots on the fore-wing and between the second subcostal and radial of the hind-wing may be absent.

In the male the fore-wing has a sharp apical angle, and the posterior margin is slightly concave. In the female the apex is more rounded, and the posterior margin is nearly straight. The hind-wing in the female has the anal angle slightly prolonged, but less so than in the male.

1 ♂, 2 ♀♀ (Venezuela), in Hope Collection, Oxford.

All three specimens were captured by Dr. G. B. Longstaff; the male and one female on January 9, 1913, at an altitude of about 1300 ft., below Zigzag Station, La Guaira, Venezuela; the second female on January 11, 1913, at about 1000 ft., between Curatici and Zigzag.

The present is the Venezuelan form of the group containing *H. jaliscana*, Schaus (Mexico), *H. lenoris*, Reak. (Mexico), *H. idiotica*, Butl., and *H. crocea*, Bates (Costa Rica). The earliest-named of the group appears to be *H. crocea*, which is probably indistinguishable from *H. lenoris*, as remarked by Godman and Salvin (Biol. Centr.-Amer., Rhopalocera, vol. ii, pp. 127–8). *H. idiotica* may be the same; the locality of the type is unknown.

H. longstaffi is distinguished from *H. crocea* by the absence of orange suffusion on the upper surface of the hind-wing; Dr. Longstaff's specimens differ from co-types of *H. jaliscana* by the deeper colour in both sexes, by the fainter development of the fuscous markings at the apex of the fore-wing, and by the much greater prominence of the dark costal spots on the under surface of the hind-wing.

A male Pieris was captured by Dr. G. B. Longstaff, at an elevation of about 1300 ft., between Zigzag Station and the port of La Guaira, Venezuela, on March 29, 1907. This capture is recorded in his book, "Butterfly Hunting in Many Lands," 1912, p. 320, and the specimen is well figured on Plate III, figs. 1, 2 of the same volume. At the same place, on January 11, 1913, Dr. Longstaff caught, together with specimens which appear to be referable to *P. sevata*, Feld., a female Pierine which I believe to be conspecific with the male above mentioned. These two specimens were referred to by me in Proc. Ent. Soc. Lond., 1913, pp. cxiii, cxiv, and are here described under the name of *Pieris janeta.*

5. **Pieris janeta,** sp. n. (Plate II, figs. 5, 6.)

♂. Exp. al. 62 mm. *Upperside* white with a slight but distinct greenish tinge. A slight fuscous edging to the costal and posterior margin, expanding somewhat at the apex, and prolonged nearly to the anal angle. A somewhat paler fuscous streak fills the space between the costa and costal vein for about two-thirds of the distance from base to apex. Fore-wing otherwise immaculate. Conspicuous streaks of roughened texture, dead white in colour, accompanying both sides of the submedian vein, of the median trunk from the origin of its first branch to that of its third, and of the median branches themselves. They are also found on both sides of the lower, and on the inner, or posterior, side of the upper radial and of that part of the subcostal trunk from which the upper radial originates, on the outer side of the two discocellular veins, and finally as a small patch in the upper and distal angle of the cell. The streaks generally fuse together at the root of each interspace, but in the interspace between median and submedian they remain distinct, neither streak reaching inwards as far as the median trunk. Hind-wing immaculate; roughened streaks like those on the fore-wing accompanying the subcostal and median veins. Third branch of subcostal in fore-wing very short.

Underside: fore-wings generally dull white; dead white where the roughened streaks show through from the upper surface. Apex and costa pale ochreous. Hind-wings uniformly ochreous, of a somewhat deeper shade than the apex of the fore-wing; a fuscous spot, like that in the female, occupying the angle between the lower discocellular and third branch of the median vein. The costa thinly edged with bright yellow; a minute spot of the same at the root of the subcostal vein.

♀. Exp. al. 60 mm. *Upperside* dull creamy white; not tinged with greenish, as in the male. Fore-wing with a fuscous shade along the costa, filling the space between the costa and the subcostal vein at the base, and for rather more than half the length of the cell. This shade is continued distally as a narrowing line along the costa as far as the apex, where it fuses with a fuscous apical patch, small in extent and prolonged as a narrow tapering band along the posterior margin as far as the first branch of the median vein. A few fuscous scales on the lower discocellular vein. Hind-wing immaculate. Anal angle slightly prolonged. The third branch of the subcostal in the fore-wing appears to be absent.

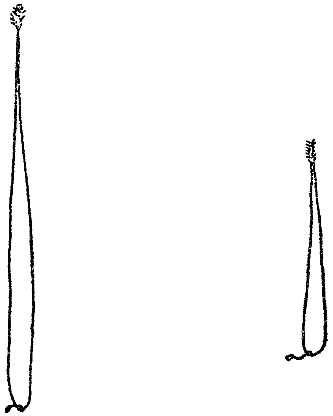


FIG. 4.
P. janeta, n. sp. × 120.

FIG. 5.
P. sevata, Feld. × 120.

SCENT-SCALES.

Underside: fore-wing dull white, apex and costa pale greyish ochreous. Hind-wing pale ochreous with a slight pinkish shade; a fuscous spot 1–2 mm. in diameter, close to the lower discocellular vein, in the interspace between the third median branch and the radial. The costa edged with deep yellow; a minute spot of the same at the root of the subcostal vein.

The male of *P. janeta* is easily distinguishable from the male of *P. sevata* by the character and distribution of the scent-scales. These in *P. janeta* are on an average more than half as long again as in *P. sevata*. Moreover, in *P. sevata* the mealy streaks formed by these scales fuse along the inner or posterior side of the median vein proximally to the origin of the first median branch; in *P. janeta* the area indicated is free from scent-scales (*see* Proc. Ent. Soc. Lond., *loc. cit.*, where "submedian" should be read for "internal").

P. janeta may perhaps be a subspecies of *P. sincera*, described by Weymer (Reiss und Stübel, Reisen in Sud.-Amerika, 1890, p. 123; Taf. III, fig. 19), from a male specimen captured on the sea-level at Guayaquil, Ecuador. But it differs in several particulars from Weymer's figure and description.

6. **Pieris howarthi**, sp. n. (Plate II, figs. 7–10.)

♂. Exp. al. 58 mm. *Upperside* dull white very slightly tinged with green. Fore-wing with pale fuscous spots on the apex and along the hind-margin, at the extremities of the branches of the subcostal (except the first), of the two radials and of the branches of the median; the first and last of these spots being represented only by a few fuscous scales. A conspicuous dark fuscous spot on the lower discocellular. Conspicuous streaks of roughened texture, dead white in colour, accompanying both sides of the first and second median branches and of the submedian vein; also the inner side of the third median and of the median trunk from the origin of the first branch to that of the third. Beneath, the fore-wing is dull white, the apical region pale fuscous. The discocellular spot is larger than on the upper surface, and of a less deep fuscous shade. The roughened areas of the upper surface show through as dead white streaks. There are traces of a pale fuscous discal spot on each side of the third median, and above the second median, in each case about half-way between the cell and the margin of the wing.

The hind-wing is immaculate above, and shows no roughened streaks. Beneath, it is of a pale yellow ochre, plentifully besprinkled with pale fuscous scales like those of the fore-wing. These are more closely set in some places than in others, forming a brownish shade over the base of the wing; this shade occupies most of the space between the costal and first subcostal branches, a quarter or more of the subcostal interspace, and nearly the whole of the cell, stopping just short of the lower discocellular. Outside the cell it accompanies the inner side of the median trunk and first median branch, but leaves free the greater part of the course of the submedian vein. In the angle between the median trunk and the first median branch, it passes into a curved band which takes its course round the end of the cell, turns forward, and becomes lost on the lower aspect of the second subcostal. The fuscous shade is somewhat deeper just anteriorly to the third median branch than elsewhere, but it does not form a definite spot. A much paler fuscous infusion forms a broad marginal shading to the wing. There is a minute dark fuscous spot on the lower discocellular, close to the origin of the radial; the costa is edged with rich orange, prolonged along the margin as a narrowing streak as far as the end of the first subcostal. A spot of the same colour occupies the root of the subcostal at its junction with the body.

♀. Exp. al. 52 mm. (Another ♀ measures 54 mm.) *Upperside* white tinged with greenish yellow. Fore-wing with a slight duskiness along the costa, which opposite the end of the cell passes into a definite dark streak reaching to the apex. The extremities of the veins along the hind margin marked, as in the male, with fuscous spots; these diminish from before backwards; no spot on the submedian vein. A dark fuscous spot, larger than in the male, occupies nearly the whole of the lower discocellular vein; and dark discal spots, similar in character and situation to those on the lower surface in the male, but more pronounced, occur in connection with the second and third median branches. The series is continued by another smaller spot internal to the first median branch. Hind-wing immaculate except for a minute dark spot on the lower discocellular vein.

Beneath, the fore-wings are white, tinged with the same greenish yellow as on the upper surface; but even paler, especially towards the inner margin. The apical area is ochre yellow dusted with yellowish brown. The same brownish dusting is continued inwardly as an ill-defined streak along the costa, but dies out before reaching the body. Within the apical area it collects chiefly at the marginal ends of the veins, forming indistinct spots which are prolonged as a diminishing series as far as the termination of the first median. A further condensation of brownish or fuscous scales forms a patch at the inner end of the apical area where this meets the costa. This patch is in series with dark discal spots occupying corresponding situations with those on the upper surface; the last of them is marked only by a few brown scales. A dark oval spot, larger than the corresponding spot on the upper surface, occupies the lower discocellular vein. The ground-colour of the hind-wings is the same as that of the apical area of the fore-wings, viz.

yellow ochre. Like the latter area it is plentifully dusted over with yellowish brown scales. These form a deep shade over the basal half of the wing, terminating distally by a curved edge running nearly parallel with the wing-margin, and leaving a small area of the yellow ground-colour at and beyond the end of the cell. Broad rays of a paler shade of yellowish brown accompany the distal portions of the veins as they traverse the yellow marginal area. The veins themselves, with their branches, share in the ochre yellow of the ground-colour. There is a conspicuous dark brown spot, larger than that of the upper surface, on the lower discocellular vein, close to the origin of the radial. The costa is edged with rich orange, and the same colour is prolonged round the base of the wing as far as the origin of the subcostal vein.

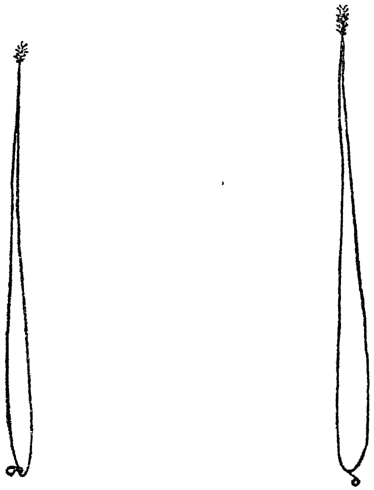


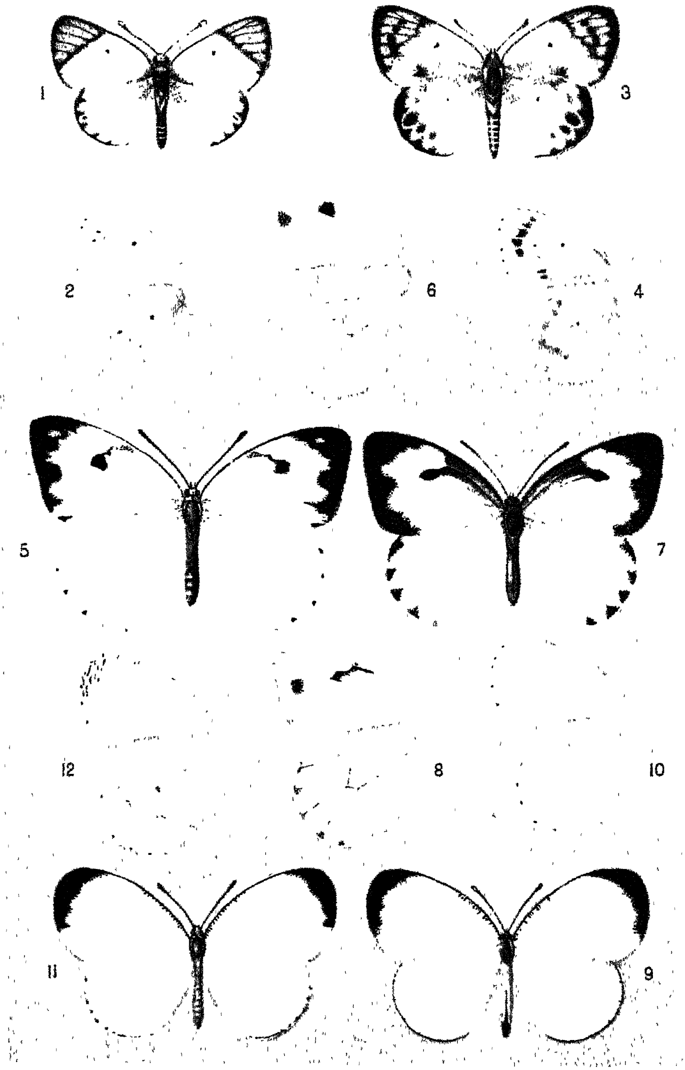
FIG. 6. *P. howarthi*, n. sp. × 120.

FIG. 7. *P. josepha*, Godm. & Salv. × 120.

SCENT-SCALES.

The third subcostal branch of the fore-wing is present in a rudimentary form on the right side of the male type and both sides of the female type. It appears to be absent from the left side of the male type, and from both sides of another female in the Hope Collection.

1 ♂, 2 ♀♀ in Hope Collection, Oxford. These were captured on the sea-level, at Tembabichi Bay, Lower



H. Knight del West, Newman chr

NEW FORMS OF PIERINAE

EXPLANATION OF PLATE II.

FIG. 1.	*Hesperocharis*	*longstaffi,*	n. subsp.,	♂,		Venezuela.
2.	„	„	„	„	underside,	„
3.	„	„	„	♀,		„
4.	„	„	„	„	underside,	„
5.	*Pieris*	*janeta,*	n. sp.,	♂,		„
6.	„		„	♀,		„
7.	*Pieris*	*howarthi,*	„	♂,		Lower California.
8.	„		„	„	underside,	„
9.	„		„	♀,		„
10.	„		„	„	underside,	„

NOTE.—FIG. 2. A small fuscous spot on the costa of the fore-wing, present in the type, is not shown in the figure.

FIG. 5. A minute yellow spot at the root of the subcostal vein in the hind-wing underside is omitted from the figure.

Explanation of Plate I.

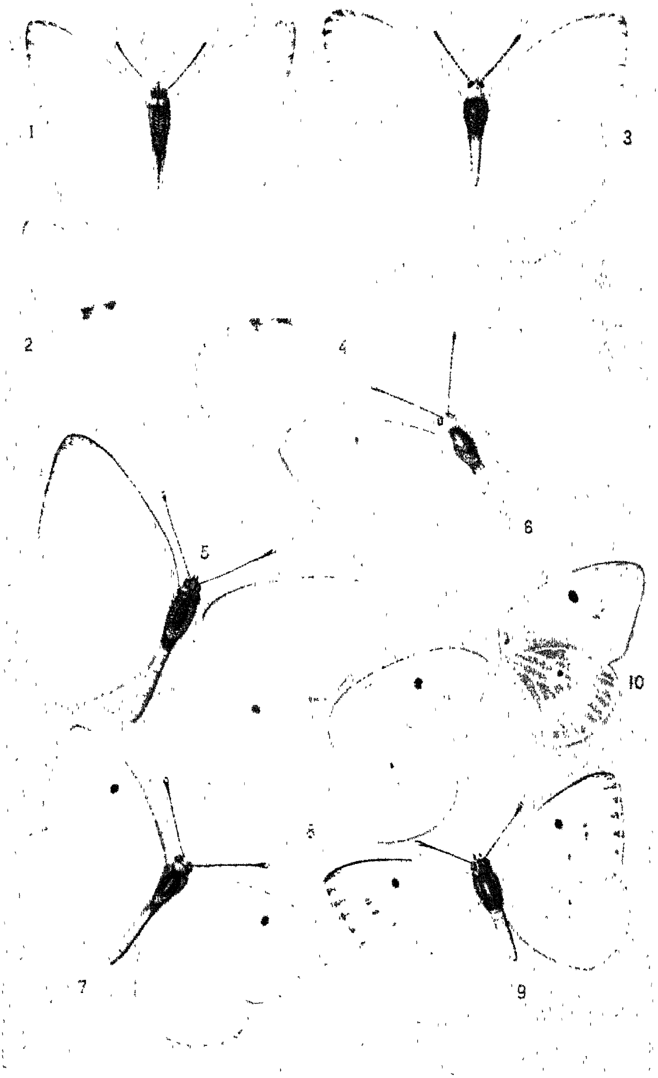
Fig. 1.	*Teracolus rogersi,*	n. sp.,	♂,		Taveta.
2.	„	„	„	underside,	„
3.	„	„	♀,		„
4.	„	„	„	underside,	„
5.	*Belenois victoria,*	„	♂,		Tiriki.
6.	„	„	„	underside,	„
7.	„	„	♀,		„
8.	„	„	„	underside,	„
9.	*Nychitona wigginsi,*	n. subsp.,	♂,		Toro.
10.	„	„	„	underside,	„
11.	„	„	♀,		Entebbe.
12.	„	„	„	underside,	„

Note.—Fig. 2. The type has two minute subapical spots not shown in the figure; in the hind-wing the relative size of the first and second submarginal spots should be reversed, and the spot nearest the anal angle should be omitted.

Figs. 2 and 4. The discocellular spot in the hind-wing of each type is touched proximally with orange.

Fig. 6. The costal orange streak in the type is not prolonged beyond the termination of the first subcostal branch.

Fig. 8. The marginal spots of the hind-wing are in the type of the same colour as the remaining spots of the hind-wing.



H. Knight del. West, Newman chr.

NEW FORMS OF PIERINAE.

California, Lat. 26° 5 N., by Mr. Osbert H. Howarth, so long ago as March 21, 1898. They have hitherto remained undescribed, but were mentioned by me in Proc. Ent. Soc. Lond., 1913, p. cxiv.

P. howarthi belongs to the same section of *Pieris* as the preceding species. Its nearest relatives are *P. josepha*, Godm. & Salv., *P. josephina*, Godt., and *P. amaryllis*, Fabr. (Central America and West Indian Islands). It is quite distinct from all of these, being much smaller, and differing markedly on the underside. It resembles *P. josepha* and *P. josephina* in the character of its plume-scales, which are some of the longest known to me in the whole sub-family of Pierines.

NOTE.—Owing to a prolonged absence from England, the author was unable to superintend the printing of the Plates which have been prepared from Mr. H. Knight's admirable drawings. A few very slight inaccuracies have resulted, attention to which is called at the foot of the Explanation of each Plate.

EXPLANATION OF PLATES I, II.

[*See Explanation facing the* PLATES.]

12

[*From the* PROCEEDINGS OF THE ZOOLOGICAL SOCIETY OF LONDON, 1916.]
[Published March 1916.]

On a Collection of Moths made in Somaliland by Mr. W. Feather. By Professor E. B. POULTON, M.A., F.R.S., F.Z.S. With Descriptions of New Species, by Sir G. F. HAMPSON, Bart., L. B. PROUT, J. H. DURRANT, and Dr. KARL JORDAN.

(Plates I. & II.*)

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Hemidromodes, gen n. 144
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Sesquialtera, gen. n. 162
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Calamoschœna, gen. n. 169
Nomima, gen. n. 178
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109 species and 2 subspecies are also described as new.

The moths described in the following pages were very carefully collected by Mr. Walter Feather, who preserved excellent data. Sir George Hampson has described the new species of all the groups except the Sphingidæ, by Dr. Karl Jordan, the Geometridæ, by Mr. L. B. Prout, and the Tineina, by Mr. J. H. Durrant. The order of the species is from the more specialised to the more generalised except in the Geometridæ, which Mr. Prout has arranged in the opposite sequence.

Types of the species described by Sir George Hampson and Mr. Durrant are in the collection of the British Museum, co-types, when the series permits, in the Hope Department, Oxford University Museum, and Mr. Feather's collection. Dr. Jordan's and Mr. Prout's types are in the Hope Collection, 'co-types, when the series permits, in the British Museum, Mr. Feather's collection, and that of the describer. This statement renders unnecessary any further reference to the disposition of types and co-types in the descriptive part of this memoir.

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* For explanation of the Plates, see pp. 181–2.

The numbers prefixed to the names of species in the first part of the memoir are those of Hampson's 'Catalogue of Lepidoptera Phalænæ in the British Museum,' the position of new species being indicated by letters added to the numbers of the most closely allied species in the Catalogue. Thus species 2094*a* would immediately follow 2094 in the Arctianæ of the Catalogue.

The specimens were collected at the following localities, of which the descriptions have been kindly furnished by Mr. Feather:—

MANDERA.

Forty-seven miles south-west of Berbera, alt. 3000 ft.

Rocks, grey and red granite.

Open and bush country, bush being mainly made up of thorny trees, nearly all flat-topped Acacias or Mimosa. Big areas covered with fibre-plants (*Sanseveria ehrenbergi*).

GAN LIBBAH.

(The "Lion's Paw.")

In the Golis Mts., seven miles east of Mandera, alt. 5800 ft.

Rock, limestone (Jurassic).

Good patches of big trees, mainly Juniper; also Euphorbias. Good grass land with scarcely any thorn-bush.

BUGGAN.

Ten miles south of Mandera, alt. 3500 ft.

Rock, granite.

Thorn country, fairly open: few big wild Fig-trees.

HARGAISA.

One hundred and twenty miles south-west of Berbera, alt. 4000 ft.

Bush and trees same as Mandera, but a little denser. Bigger areas of *Sanseveria ehrenbergi*.

BERBERA.

All the moths I captured at Berbera were taken in the Bungalow at light. This was close to the sea; the maritime plain is very thinly covered with a low-growing thorn-bush.

Rock, coralline limestone.

DURBAR.

Nine miles south of Berbera, alt. 400 ft.

Rock, limestone.

Open land, few Palms with some rough grass.

Durbar is really the waterworks for Berbera, and at one time there was a poor sort of Government garden there.

With few exceptions the specimens were captured at Mandera, and this place is to be understood when no locality is mentioned in the text. Mandera is, however, always quoted for those comparatively few species which were also taken elsewhere. The specimens from Hargaisa dated Oct. 1908 were taken during a period of about two or three weeks by Captain Jorkinson.

Mr. Feather writes concerning the method of capture:—"I may say that all the moths were collected at light. I only remember taking one species—I think a Geometer—otherwise, and that I got in a porcupine-burrow along with a Skipper. I sugared many times, but the only insects that came were ants, and they completely covered the sugar."

Mr. L. B. Prout, in the introduction to the Geometridæ (p. 142), draws attention to the remarkable preponderance of females; and the same unusual condition is to be found again and again throughout the rest of the collection. Observations made Sept. 12–15, 1915, in Bombay Harbour, on the return from the visit of the British Association to Australia, have led me to believe that nocturnal flights of female Lepidoptera tend to occur during wet weather. The Bombay species included the females of certain butterflies which flew at night and came to light with the moths. The fact seems to be very interesting and well worthy of a separate communication dealing with these Somaliland moths and my own experience in Bombay. In order to test the relationship of female preponderance to wet weather, I have asked Mr. Feather to supply a record of the rainfall and temperature at Mandera. He kindly replied as follows:—

"I am enclosing the record of rainfall for Mandera, and have used much the same words as I wrote in my diary. My impressions of the rainfall were guided by what I had been used to in England, as this was my first visit to Africa.

"I cannot give you the amount of rain, as we had no rain-gauge. I should say the annual rainfall at Mandera is about 10-12 inches. Wet nights are a great rarity, the rain oftenest coming in short heavy showers in the morning or afternoon.

"The river I mention is, of course, a dry river-bed, except just after rain. The longest time that I remember water running down the channel was for about 8 hours. The river-bed is about 120 yards wide, and in one part was a very small stream of permanent water, which appeared between some rocks and ran on the surface for 20-30 yards before disappearing in the sand."

RECORD of Rain at Mandera, Somaliland, from Nov. 14th, 1907, to June 23rd, 1909, and of Temperatures, taken in the shade, from March 14th, 1908, to June 30th, 1909.

Date.	Morning and afternoon temperature (Fahrenheit).				Rainfall.
Nov. 14, 1907.	.. . .	..			Rain in morning.
— 15, —	.. .	. .. .			Rain in afternoon.
Jan. 22, 1908.		.... . .			Fine drizzle all day.
Mar. 14, —	6.30 A.M.	65 deg.	1.30 P.M.	102 deg.	
— 15, —	— —	68 —	2.0 —	103 —	
— 16, —	6.0 —	63 —	— —	105 —	
— 17, —	6.30 —	66 —	1.0 —	104 —	
— 18, —	— —	65 —	1.30 —	104 —	
— 19, —	6.0 —	68 —	— —	105 —	
— 20, —	6.30 —	68 —	12.30 —	100 —	
— 21, —	— —	70 —	2.0 —	106 —	
— 22, —	— —	63 —	2.30 —	108 —	
— 23, —	— —	70 —			
— 24, —	6.0 —	68 —	2.30 —	98 —	
April 1, —	— —	70 —			
— 2, —	— —	67 —	12.30 —	93 —	
— 3, —	— —	68 —			
— 4, —	— —	69 —			
— 7, —	— —	70 —	1.0 —	90 —	
— 8, —	— —	75 —			
— 9, —	— —	68 —			
— 10, —	— —	68 —	1.0 —	78 —	Dull day · a few drops of rain
— 11, —	— —	68 —	— —	85 —	
— 12, —	— —	64 —	— —	84 —	
— 13, —	— —	59 —			
— 14, —	— —	64 —	2.0 —	81 —	
— 15, —	— —	59 —	1.30 —	85 —	
— 16, —	— —	61 —	1.0 —	88 —	
— 17, —			2.0 —	96 —	
— 18, —	— —	66 —	— —	96 —	
— 19, —	— —	77 —	— —	97 —	
— 20, —	— —	80 —	— —	86 —	Slight shower in morning.
— 21, —	5.30 —	75 —	1.0 —	93 —	Heavy shower.
— 22, —	— —	71 —	1.30 —	86 —	
— 23, —	— —	69 —	2.0 —	79 —	Heavy rain for 1½ hrs.
— 24, —	6.0 —	70 —	1.30 —	81	Rain for 2 hrs.
— 25, —	— —	73 —	2.0 —	96 —	
— 26, —	— —	73 —	— —	93 —	
— 27, —	— —	73 —	1.0	95 —	
— 28, —	— —	77 —	2.0 —	95 —	
— 29, —	5.30 —	77 —	— —	96 —	
— 30, —	6.0 —	77 —	— —	87 —	
May 1, —	— —	75 —	— —	84 —	
— 2, —	— —	71 —	— —	90 —	
— 3, —			— —	93 —	
— 4, —	5.30 —	78 —	12.30 —	93 —	Slight shower.
— 5, —	6.0 —	78 —	2.0 —	95 —	Slight shower.
— 6, —	— —	78 —	— —	93 —	A short shower a little before sunset. During the shower hailstones ¼ in. to ¾ in. in diameter fell.
— 7, —	— —	74 —	— —	84 —	
— 8, —	— —	72 —	— —	93 —	
— 9, —	— —	70 —			
— 10, —	— —	75 —	— —	84 —	

Date.	Morning and afternoon temperature (Fahrenheit).		Rainfall.
May 12, 1908.	5.30 A.M. 73 deg.	1.30 P.M. 94 deg.	
— 13, —	— — 74 —	— — 94 —	Short shower.
— 14, —	6.0 — 75 —	2.0 — 94 —	Heavy shower in afternoon for 1½ hrs.; hailstones.
— 15, —	— — 75 —	— — 93 —	
— 16, —	— — 76 —	— — 84 —	Slight shower.
— 17, —	— — 70 —	1.30 — 69 —	Fairly heavy shower. Temperature fell considerably.
— 18, —	— — 66 —	— — 84 —	
— 19, —	— — 65 —	— — 84 —	
— 20, —	— — 75 —	— — 91 —	
— 21, —	— — 71 —	— — 91 —	
— 22, —	— — 68 —	— — 91 —	
— 23, —	— — 68 —	— — 94 —	
— 24, —	— — 75 —	— — 94 —	
— 25, —	— — 74 —	1.0 — 94 —	
— 26, —	— — 73 —	— — 94 —	
— 27, —	— — 75 —	1.30 — 93 —	
— 28, —	— — 65 —	— — 91 —	
— 29, —	— — 77 —	— — 91 —	
— 30, —	— — 79 —	— — 93 —	
— 31, —	— — 75 —	2.0 — 95 —	
June 1, —	— — 76 —	— — 95 —	
— 2, —	— — 76 —	1.30 — 94 —	
— 3, —	— — 78 —	— — 94 —	
— 4, —	— — 77 —	— — 92 —	
— 5, —	— — 75 —	— — 92 —	A good heavy shower, starting at 3 P.M. and lasting till 5 P.M.; water coming down the river in fair quantity.
— 6, —	— — 75 —	2.0 — 88 —	
— 7, —	— — 74 —	— — 91 —	
— 8, —	— — 76 —	— — 93 —	
— 9, —	— — 75 —	— — 96 —	
— 10, —	— — 77 —	— — 95 —	
— 11, —	— — 75 —	— — 93 —	
— 12, —	— — 74 —	— — 92 —	
— 13, —	— — 73 —	— — 93 —	
— 15, —	— — 73 —	— — 95 —	
— 16, —	— — 75 —	— — 94 —	
— 17, —	— — 78 —	— — 94 —	
— 18, —	— — 78 —	— — 94 —	Rain-storms all round, but none at Mandera.
— 19*, —	— — 78 —	— — 94 —	
— 29, —	— — 75 —	— — 102 —	Water came down river last night. Evidently heavy rain in the hills, though none at Mandera.
— 30, —	— — 73 —	— — 101 —	
July 1, —	— — 79 —	— — 102 —	
— 2, —	— — 75 —	— — 103 —	
— 3, —	— — 78 —	— — 98 —	
— 4, —	— — 78 —	— — 101 —	
— 5, —		— — 100 —	Heavy shower; water coming down river.
— 6, —	— — 75 —	— — 100 —	
— 7, —	— — 77 —	— — 100 —	
— 8, —	— — 77 —	— — 103 —	

* Here I have a note that I took the thermometer from the inside of the messhouse and hung it on the veranda (well in the shade). The temperature then immediately rose to 103 deg.

Date.	Morning and afternoon temperature (Fahrenheit).				Rainfall.
July 9, 1908.	6.0 A.M.	78 deg.	1.30 P.M.	101 deg.	
— 10, —	— —	77 —	2.0 —	101 —	
— 11, —	— —	76 —	— —	101 —	
— 12, —			— —	101 —	
— 13, —	— —	76 —	— —	102 —	
— 14, —	— —	77 —	— —	102 —	
— 15, —	— —	77 —	— —	102 —	
— 16, —	— —	78 —	— —	102 —	
— 17, —	— —	77 —	— —	100 —	
— 18, —	— —	75 —	— —	102 —	
— 19, —	— —	77 —			
— 20, —	— —	77 —	— —	99 —	
— 21, —	— —	75 —	— —	98 —	
— 22, —	— —	75 —	— —	99 —	
— 23, —	— —	78 —	3.0 —	98 —	
— 24, —	— —	78 —	2.0 —	98 —	
— 25, —	— —	78 —	— —	98 —	
— 26, —			— —	100 —	
— 27, —	— —	73 —	— —	95 —	
— 28, —	— —	76 —	— —	98 —	
— 29, —	— —	70 —	— —	95 —	
— 30, —	— —	70 —	— —	93 —	Had two rather dull days.
— 31, —	— —	75 —	— —	97 —	A good shower this evening.
Aug. 1, —	— —	75 —	— —	92 —	
— 2, —	— —	75 —	— —	87 —	
— 3, —	— —	73 —	— —	92 —	
— 4, —	— —	77 —	— —	97 —	
— 5, —	— —	78 —	— —	100 —	
— 6, —	— —	78 —	2.30 —	101 —	
— 7, —	— —	75 —	— —	90 —	
— 8, —	— —	70 —	2.0 —	92 —	
— 9, —	— —	73 —	2.30 —	93 —	
— 10, —	— —	76 —	2.0 —	97 —	
— 11, —	— —	71 —	— —	92 —	
— 12, —	— —	78 —	2.30 —	100 —	
— 13, —	— —	76 —	2.0 —	98 —	
— 14, —	— —	77 —	2.30 —	99 —	
— 15, —	— —	76 —	— —	101 —	
— 16, —			2.0 —	101 —	
— 17, —	— —	79 —	2.0 —	101 —	
— 18, —	— —	80 —	— —	103 —	
— 19, —	— —	79 —	— —	101 —	
— 20, —	6.30 —	79 —	— —	103 —	
— 21, —	6.0 —	80 —	— —	101 —	
— 22, —	— —	79 —	— —	101 —	
— 23, —		…………	…………		A shower this evening.
— 24, —	— —	75 —	2.30 —	98 —	
— 25, —	— —	77 —	— —	100 —	
— 26, —	— —	77 —	— —	103 —	
— 27, —	— —	78 —	2.0 —	100 —	
— 28, —	6.30 —	77 —	2.30 —	100 —	
— 29, —	— —	75 —	2.0 —	98 —	
[— 31, —	Berbera.—Temp. in Bungalow, 116 deg.]				
Sept. 3, —	6.0 A.M.	76 deg.	2.0 P.M.	98 deg.	
— 4, —	6.30 —	77 —	2.30 —	98 —	
— 5, —	6.0 —	75 —	— —	99 —	
— 6, —	— —	73 —	— —	95 —	
— 7, —	— —	74 —	— —	94 —	
— 8, —	6.30 —	77 —	— —	97 —	
— 9, —	6.0 —	77 —	2.0 —	99 —	
— 10, —	— —	75 —	2.30 —	102 —	

Date.	Morning and afternoon temperature (Fahrenheit).				Rainfall.
Sept. 11, 1908.	6.30 A.M.	75 deg.	2.30 P.M.	102 deg.	
— 12, —			3.0 —	104 —	
— 13, —	7.0 —	79 —	— —	101 —	
— 14, —	6.0 —	75 —	3.30 —	95 —	
— 15, —	7.0 —	77 —	2.30 —	101 —	
— 16, —	6.30 —	78 —	— —	96 —	
— 17, —	— —	75 —	1.30 —	98 —	
— 18, —	— —	76 —	2.30 —	96 —	
— 19, —	6.0 —	77 —	2.0 —	87 —	
— 20, —	— —	72 —	— —	95 —	Rain around, but only a few drops here: Mandera often seems to miss the rain.
— 21, —	— —	75 —	— —	95 —	
— 22, —	— —	76 —	2.30 —	99 —	
— 23, —	— —	76 —	— —	99 —	
— 24, —	— —	74 —	2.0 —	96 —	A few drops of rain at noon.
— 25, —	— —	75 —	— —	95 —	A good heavy shower, lasting about 20 mins.
— 26, —	5.30 —	73 —	2.30 —	94 —	
— 27, —	6.0 —	73 —	1.30 —	94 —	
— 28, —	— —	74 —	— —	89 —	
— 29, —	— —	74 —	— —	95 —	
— 30, —	— —	75 —	— —	90 —	A very slight shower at night.
					A good shower lasting 15 mins. this day. The last few days have been cloudy in early morning and late afternoon.
Oct. 1, —	— —	74 —	— —	90 —	
— 2, —	— —	72 —	2.0 —	92 —	
— 3, —	— —	75 —	1.30 —	92 —	
— 4, —	— —	75 —	2.0 —	92 —	
— 5, —	— —	73 —	1.30 —	90 —	
— 6, —	— —	72 —	— —	90 —	Heavy shower for 10 mins.
— 7, —	— —	69 —	— —	88 —	Slight shower in afternoon.
— 8, —	— —	68 —	2.0 —	88 —	
— 9, —	— —	72 —	— —	90 —	
— 10, —	6.30 —	66 —	— —	89 —	
— 11, —	6.0 —	67 —	— —	92 —	
— 12, —	6.15 —	65 —	1.30 —	94 —	
— 13, —	6.0 —	75 —	2.0 —	80 —	A few drops of rain.
— 14, —	— —	65 —	1.30 —	86 —	Water down river in quantity, but no rain at Mandera.
— 15, —	— —	63 —	— —	87 —	
— 16, —	— —	67 —	2.0 —	87 —	
— 17, —	— —	64 —	1.30 —	87 —	
— 18, —	— —	65 —	— —	87 —	
— 19, —	— —	63 —	2.0 —	85 —	
— 20, —	— —	65 —	— —	83 —	
— 21, —	6.30 —	59 —	— —	85 —	
— 22, —	— —	61 —	— —	83 —	
— 23, —	6.0 —	65 —	— —	83 —	
— 24, —	— —	59 —	— —	83 —	
— 25, —	— —	61 —	2.0 —	80 —	
— 26, —	— —	60 —	— —	78 —	A few drops of rain at night.
— 27, —	— —	66 —	— —	77 —	Slight shower in morning.
— 28, —	— —	68 —	— —	83 —	
— 29, —	— —	58 —	— —	87 —	
— 30, —	— —	61 —	— —	88 —	
— 31, —	— —	60 —	— —	89 —	
Nov. 1, —	— —	61 —	— —	88 —	
— 2, —	— —	68 —	— —	80 —	A good shower.
— 3, —	— —	66 —	1.30 —	76 —	
— 4, —	— —	68 —	— —	82 —	
[— 9, —	Gan Libbah.—Few drops of rain.]				

Date.			Morning and afternoon temperature (Fahrenheit)				Rainfall.
[Nov.	10,	1908.	Gan Libbah. Rain for 2 hrs.]				
—	12,	—	6 0 A.M.	62 deg.			
—	13,	—	—	61 —	2 0 P.M.	82 deg.	
—	14,				2 30	78 —	
	15,	—	—	59 —	2 0 —	80	
	16,	—		59		80	
—	17,	—	—	56	1 30	82	
—	18,	—	—	60	—	80 —	
—	19,	—	—	59 —	—	80 —	
—	20,	—	—	59 —	—	80 —	
—	21,		—	57 —			
—	22,	—		53 —			
—	23,	—	—	56 —			
—	24,	—	—	53 —	1.30 —	85 —	
	25,	—	—	50 —	3.30 —	82 —	
—	26,	—	—	55 —	2 30 —	78 —	
—	27,	—	—	48	2.30	74 —	
	28,			55 —			
|	29,		Berbera.				A few drops.]
Dec.	24,	—	—	51 —	2.0	72	
	25,		—	55 —	3.0 —	70 —	
—	26,	—	—	53 —	—	75	
—	27,	—	6.30 —	48 —	2.0 —	75 —	
	28,	—	6.0 —	51 —	1.0 —	75 —	
—	29,	—	—	57	1.30 —	73 —	
	30,	—	—	53 —	—	73 —	
—	31,	—	—	54 —	1.0 —	73 —	
Jan.	1,	1909.	—	52 —		72 —	
—	2,		—	51 —		73 —	
—	3,	—	—	49 —	—	72 —	
—	4,	—	—	53 —	—	70 —	
—	5,	—	—	51			
—	11,	—	—	60 —	—	72	Fairly heavy dews for the last 4 weeks.
—	12,	—	—	55 —	—	73 —	
—	13,	—	—	50	2.0	75 —	
—	14,	—	—	53 —		81 —	
—	15,	—	—	55 —	1.30	80 —	
—	16,	—	—	60 —		81 —	
—	17,	—	—	58 —	2.0 —	83 —	
	18,	—	—	60 —	1.30 —	80 —	
—	19,	—	—	60 —	—	80 —	
	20,	—	—	61 —		81	
	21,	—	—	63	2.0	86 —	
	22,	—	—	60	1.30 —	78	
	23,	—	—	63	1.30	73 —	A few drops.
—	24,	—	—	60 —	2.0	75	
—	25,	—	—	60	1.30 —	78	
	26,	—	—	60	—	77 —	
	27,	—	—	58		76 —	
	28,	—	—	53 —	2.0 —	70 —	
—	29,	—	—	50 —	1.0 —	70 —	
—	30,	—	—	50 —	1.30 —	75 —	
—	31,	—	—	51 —	—	77 —	
Feb.	1,	—	—	52 —	—	80	
—	2,	—	—	55 —	—	80 —	
—	3,	—	—	55 —	—	75 —	
—	4,	—	—	60 —	—	75 —	
—	5,	—	—	60 —	—	77 —	
—	6,	—	—	61 —	—	76 —	
—	7,	—	—	60 —	2.0 —	74 —	
—	8,	—	—	57 —	—	75 —	

Date.	Morning and afternoon temperature (Fahrenheit).				Rainfall.
Feb. 9, 1909.	6.0 A.M.	55 deg.	2.0 P.M.	73 deg.	
— 10, —	— —	56 —	— —	73 —	
— 11, —	— —	58 —	1.30 —	85 —	
— 12, —	— —	57 —	— —	75 —	
— 13, —	— —	58 —	— —	79 —	
— 14, —	— —	59 —	2.0 —	79 —	
— 15, —	— —	58 —	1.30 —	79 —	
— 16, —	— —	55 —	1.0 —	81 —	
— 17, —	— —	54 —	— —	85 —	
— 18, —	— —	59 —	1.30 —	81 —	
— 19, —	— —	60 —	— —	84 —	
— 20, —	— —	60 —	— —	81 —	
— 21, —	— —	61 —	2.0 —	78 —	
— 22, —	— —	61 —	— —	80 —	
— 23, —	— —	56 —	1.30 —	83 —	
— 24, —	— —	56 —			
— 25, —	— —	57 —	— —	83 —	
— 26, —	— —	60 —	— —	81 —	
— 27, —	— —	57 —	— —	83 —	
— 28, —	— —	57 —	— —	81 —	
Mar. 1, —	— —	57 —	1.0 —	85 —	
— 2, —	— —	60 —	1.30 —	81 —	
— 3, —	— —	56 —	1.0 —	75 —	
— 4, —	— —	58	— —	79 —	
— 5, —	— —	59 —	1.30 —	81 —	
— 6, —	—	59 —	— —	80 —	
— 7, —	— —	61 —	1.0 —	76 —	
— 8, —	— —	61 —			
— 9, —	— —	58 —	1.30 —	80 —	
— 10, —	— —	60 —	— —	78 —	
— 11, —	— —	59 —	— —	79 —	
— 12, —	— —	58 —	— —	80 —	
— 13, —	— —	58 —	— —	82 —	
— 14, —	— —	57 —	— —	81 —	
— 15, —	— —	58 —	— —	77 —	
— 16, —	— —	57 —	— —	85 —	
— 17, —	— —	53 —	2.0 —	87 —	
— 18, —	— —	55 —	— —	85 —	
— 19, —	— —	57 —	1.30 —	82 —	
— 20, —	— —	58 —	— —	78 —	
— 21, —	— —	58 —	1.0 —	87 —	
— 22, —	— —	62 —	— —	96 —	
— 23, —	— —	65 —	— —	99 —	
— 24, —	— —	63 —	1.30 —	88 —	
— 25, —	— —	63 —	1.0 —	90 —	
— 26, —	— —	63 —	— —	91 —	
— 27, —	— —	68 —	— —	75 —	Heavy rain.
— 28, —	— —	68 —	— —	80 —	
— 29, —	— —	68 —	— —	87 —	Good shower in afternoon.
— 30, —	— —	69 —	— —	90 —	
— 31, —	— —	69 —	— —	82 —	
April 1, —	— —	69 —	1.30 —	85 —	Few drops. Much rain in hills.
— 2, —	— —	71 —	— —	87 —	Steady rain for 2 hours.
— 3, —	— —	66 —	— —	82 —	No rain, but river came down in strength.
— 4, —	— —	70 —	— —	72 —	Good shower.
— 5, —	— —	71 —	— —	82 —	Good shower.
— 6, —	— —	70 —	— —	89 —	
— 7, —	— —	70 —	— —	95 —	
— 8, —	— —	71 —	— —	95 —	Rained in afternoon. Heavy storms all round.

Date.	Morning and afternoon temperature (Fahrenheit).				Rainfall.
April 9, 1909.	6.0 A.M.	70 deg.	1.30 P.M.	67 deg.	
— 10, —	— —	68 —	— —	82 —	
— 11, —	— —	65 —			Shower in early morning.
— 12, —	— —	68 —	— —	83 —	
— 13, —	— —	72 —	— —	95 —	
— 14, —	— —	73 —	— —	97 —	Shower in afternoon.
— 15, —	— —	73 —	— —	87 —	
— 16. —	— —	71 —	— —	85	Few short showers in night. Little water coming down river at daylight.
— 17, —	— —	65 —	— —	82 —	Very heavy shower: one could only see for few yards. River in strong flood.
— 18, —	— —	65 —	1.0 —	85 —	
— 19, —	— —	68 —	— —	85 —	
— 20, —	— —	68 —	— —	95 —	
— 21, —	— —	75 —	— —	93 —	
— 22, —	— —	73 —	— —	85 —	Heavy rain-storm a few miles away.
— 23, —	— —	72 —	— —	82 —	
— 24, —	— —	67 —	— —	87 —	
— 25, —	— —	67 —	— —	88 —	
26, —	— —	67 —	— —	87 —	
— 27, —	— —	70 —	— —	91 —	
28, —	— —	68 —	— —	92 —	Few drops.
30, —	— —	70 —	— —	82 —	
May 1, —	— —	64 —	— —	88 —	
— 2, —	— —	70 —	— —	80 —	Slight shower.
— 3, —	— —	66 —	— —	88 —	
— 4, —	— —	68 —	— —	92 —	
— 5, —	— —	69 —	— —	78 —	Rather dull. Raining all round, but not here.
— 6, —	— —	72 —	— —	82 —	
— 7, —	— —	71 —	— —	92 —	Slight shower.
— 8, —	— —	72 —	— —	90 —	Little rain in afternoon.
— 9, —	— —	72 —	— —	91	Shower in afternoon.
— 10, —	— —	71 —	— —	90 —	Little rain.
— 11, —	— —	73 —	— —	95 —	
— 12, —	— —	69 —	— —	92 —	
— 13, —	— —	72 —	— —	89	
14, —	— —	71 —	— —	92 —	
— 15, —	— —	72 —	— —	94 —	
			4.0 —	104	
— 16, —	— —	72 —	1.0 —	95 —	
— 17, —	— —	73 —	— —	92 —	
— 18, —	—	70 —	— —	94	
— 19, —	— —	73 —	— —	98 —	
— 20, —	— —	72 —	— —	95	
— 21, —	— —	70 —	— —	92 —	
— 22, —	— —	71 —	— —	98 —	
— 23, —	— —	70 —	— —	98 —	
— 24, —	— —	71 —	— —	89 —	Heavy rain for about 10 mins.
— 25, —	— —	69 —	— —	82	Few drops about 5 P.M. Much rain in immediate neighbourhood.
— 26, —	— —	67 —	2.0 —	90 —	
— 27, —	— —	71 —	1.0 —	89 —	
— 28, —	— —	71 —	— —	90 —	
— 29, —	— —	69 —	— —	88 —	
— 30,			4.0 —	99 —	
— 31, —	— —	71 —	1.0 —	88 —	
June 1, —	— —	71 —	— —	90 —	
— 2, —	— —	70 —	— —	90 —	
— 3, —	— —	69 —	— —	92 —	
— 4, —	— —	68 —	— —	90 —	

Date.	Morning and afternoon temperature (Fahrenheit).				Rainfall.
June 5, 1909.	6 0 A.M.	68 deg.	1.0 P.M.	90 deg.	
— 6, —	— —	69 —	— —	88 —	
— 7, —	— —	68 —	— —	91 —	
— 8, —	— —	66 —	— —	90 —	
— 9, —	— —	68 —	— —	92 —	
— 10, —	— —	68 —	— —	92 —	
— 11, —	— —	75 —	— —	95 —	
— 12, —	— —	75 —	— —	94 —	
— 13, —	— —	73 —	— —	98 —	
— 14, —	— —	73 —	— —	95 —	
— 15, —	— —	72 —	— —	93 —	
— 16, —	— —	71 —			
— 17, —	— —	72 —	— —	92 —	
— 18, —	— —	73 —	— —	94 —	
— 19. —	— —	73 —	— —	95 —	
— 20, —	— —	73 —	— —	93 —	
— 21, —	— —	73 —	— —	90 —	
— 22, —	— —	73 —	— —	92 —	
			3.0 —	100* —	
— 23, —	— —	71	1.0 —	95 —	Heavy shower about 6 P.M.
— 24, —	— —	73 —	— —	96 —	
— 25, —	— —	73 —			
— 26, —	— —	71 —	— —	90 —	
— 27, —	— —	72 —	— —	93 —	
— 28, —	— —	71 —	— —	95 —	
— 29, —	— —	70 —	— —	90 —	
— 30, —	— —	70 —	— —	89 —	

* I have a note here that the temperature usually rose to about 100 deg. about 3 P.M.

"For a further period of a little over seven months there was no rainfall at Mandera. This statement is from memory, but I am confident of its accuracy, and am very sorry I cannot find my diary to provide confirmation."

WALTER FEATHER.

HETEROCERA.

Fam. AMATIDÆ.

273. APISA CANESCENS Wlk.

Mandera.—1908: June 18,—1 ♂; Sept. 15,—1 ♂. **1909** Jan. 8,—1 ♂; Jan. 12,—1 ♂; Jan. 16,—1 ♂.

Gan Libbah.—1908: June 24,—1 ♂.

283. METARCTIA BURRA Schaus.

1909: Apr. 20,—1 ♂.

In this and all succeeding species where no locality is mentioned, Mandera is to be understood.

Fam. ARCTIADÆ.

Subfam. NOLINÆ.

63 *c*. NOLA CHIONEA Hmpsn.

1908: Mar. 22,—1 ♀.

Subfam. LITHOSIANÆ.

843. SICCIA SORDIDA Butl.

1908: Oct. 25,—1 ♀.

Subfam. ARCTIANÆ.

1677. MAENAS ARBORIFERA Butl.

1908: Apr. 30,—1 ♂; Oct. 18,—1 ♀. **1909**: Mar. 28,—1 ♂; Apr. 8,—1 ♂; Apr. 11,—1 ♂; Oct. 14,—1 ♂. **1910**: Mar. 6,—2 ♂; Mar. 12,—1 ♂; Mar. 14,—3 ♂.

1730 *a*. DIACRISIA DIVERSATA Hmpsn.

1909: Sept.—1 ♀.

DIACRISIA var. near 1812. LINEATA, Wlk.

1909: May 10,—1 ♂.

1858 *b*. ESTIGMENE GRISEATA, sp. n. (Pl. I. fig. 1, ♀.)

♀. Head and thorax brownish grey, the back of head and tips of tegulæ orange-yellow, the patagia with small black spots near base; palpi black at tips; abdomen fulvous orange with lateral series of small black spots. Fore wing brownish grey; a small black spot at base of cell; black points in the angles of cell and two beyond lower angle. Hind wing white tinged with reddish brown. Underside brownish white, the costal area of both wings tinged with red-brown; hind wing with black discoidal spot.

1909: May 21,—1 ♀ (type). *Exp.* 40 millim.

2068. TERACOTONA SUBMACULA Wlk.

1909: Oct. 22.—1 ♂.

2088. UTETHEISA PULCHELLA L.

1909: May 11,—1 ♀; May 21,—1 ♂. **1910**: Jan.,—1 ♂.

2094 *a*. SECUSIO SOMALIENSIS, sp. n. (Pl. I. fig. 2, ♀.)

♀. Head and thorax pale reddish brown tinged with grey; the vertex of head with minute black streak; the tegulæ, shoulders, and patagia near base and tips with black spots ringed with whitish; the metathorax with minute black spot; palpi brown at sides; pectus and legs whitish tinged with brown, the former with black spot at side; abdomen brownish ochreous with dorsal and sublateral series of black spots, the ventral surface whitish tinged with brown. Fore wing pale reddish brown; a subbasal black point on costa ringed with white; obliquely placed antemedial black spots on and below costa and in cell and spots nearer the base below median nervure and above vein 1, all ringed with white: two diffused waved white medial lines, rather oblique to below the cell, then incurved; obliquely placed postmedial black spots ringed with white below veins 8 and 7, then a series of diffused white spots with minute black points on the spots below veins 5 and 4; a subterminal series of diffused white spots in the interspaces. Hind wing pale grey-brown. Underside of both wings uniform pale grey-brown.

1908: Nov. 13,—1 ♀ (type). *Exp.* 36 millim.

2098. SECUSIO STRIGATA Wlk.

Mandera.—**1908**: Sept. 25,—1 ♀.

Gan Libbah.—**1908**: June 25,—1 ♂; Nov. 6,—1 ♀. **1909**: Nov. 4,—2 ♀.

Fam. AGARISTIDÆ.

84. ROTHIA AISHA Kirby.

1909: Apr. 8,—1 ♂.

122. ÆGOCERA BREVIVITTA Hmpsn.

1909: May 6,—1 ♀; May 10,—9 ♀. 1 ♀ specimen without data.

162. TUERTA TRIMENI Feld.

1909: Apr. 5,—1 ♂; Apr. 14,—1 ♂, 1 ♀; Apr. 20 or 21,—1 ♀.

Fam. NOCTUIDÆ.

Subfam. AGROTINÆ.

47 *a*. CHLORIDEA ALBIVENATA, sp. n. (Pl. I. fig. 3, ♀.)

♀. Head and thorax rufous mixed with ochreous; antennæ brownish, white towards base; palpi, pectus, legs, and abdomen ochreous irrorated with brown, the dorsum of abdomen thickly irrorated. Fore wing ochreous tinged with rufous and slightly irrorated with blackish, a stronger rufous shade along median nervure expanding towards the postmedial line; a diffused blackish streak below base of cell; a faint diffused oblique blackish antemedial line from costa to median nervure; reniform a diffused blackish spot; the veins beyond the cell slightly streaked with white to the postmedial line, which is whitish slightly defined on each side by blackish, bent outwards below costa, then minutely dentate, excurved to vein 5, then oblique, a fuscous and rufous shade beyond it; a terminal series of black points; cilia whitish tinged with brown. Hind wing ochreous suffused with brown, the terminal area broadly suffused with blackish; a large blackish discoidal spot; cilia white, tinged with brown at base. Underside ochreous, the costal areas irrorated with brown; fore wing with some fuscous along median nervure; both wings with large black discoidal spots and black subterminal shade from below costa to above inner margin.

1909: Oct. 20,—1 ♀ (type). *Exp.* 24 millim.

56. CHLORIDEA OBSOLETA Fabr.

1909: Mar. 2,– 1 ♀.

304. EUXOA SPINIFERA Hübn.

1908: Nov. 20,—1 ♀.

Subfam. HADENINÆ.

1799. DIAPHONE EUMELA Stoll.

1909: Feb. 28,—1 ♀; Apr. 8,—1 ♂; Apr. 14,—1 ♀.

1850. CIRPHIS LOREYI Dup.

1909: Jan. 11,—1 ♀.

Subfam. ACRONYCTINÆ.

3139. PERIGEA CAPENSIS Guen.

1908: Nov. 24, –1 ♀.

3552. IAMBIODES INCERTA Rothsch.

1908: June 7,—1 ♀ (in B.M.).

3623 *a*. THALATHA MELANOSTROTA, sp. n. (Pl. I. fig. 4, ♂.)

♂. Head and thorax white irrorated with black scales, the latter strongly tinged with rufous except the tegulæ; antennæ fulvous; palpi white, reddish brown above; pectus white; legs white and brown; abdomen red-brown mixed with some white and irrorated with black, the basal crest rufous, the anal tuft and ventral surface white. Fore wing grey, tinged with red-brown except on terminal area and irrorated with large black scales; faint traces of a medial line, oblique towards costa, then sinuous; an indistinct double dark postmedial line, very oblique towards costa, then sinuous and incurved below vein 3; a series of black points before termen. Hind wing white tinged with red-brown, the costal area and termen more strongly tinged; cilia white. Underside of fore wing suffused with brown; hind wing white, the costal area and termen to vein 2 irrorated with brown.

1909: Apr. 8,—1 ♂ (type). *Exp.* 26 millim.

3786. Cetola pulchra B.-Baker.

1909: Apr. 6,—1 ♀; Apr. 9,—1 ♀; Apr. 14,—1 ♂.

3792 *a*. Matopo heterochroa, sp. n. (Pl. I. fig. 5, ♂.)

Antennæ of male bipectinate with rather long branches to apex, of female ciliated.

♂. Head and tegulæ ochreous white, the latter with slight brown lines at middle and tips; thorax bluish white slightly mixed with pale brown; palpi with the 2nd joint, except at tip, and the 3rd joint brown; frons with lateral brown bars; pectus, legs, and abdomen creamy white, the fore tibiæ and the tarsi banded with blackish. Fore wing bluish white tinged in parts with brown, especially on costal and terminal areas, the veins of terminal half with slight dark streaks; a subbasal brown point below costa; antemedial line slight, dark brown, angled outwards below costa and strongly in submedian fold and above inner margin; claviform defined by dark brown, minute; reniform faint, yellowish with slight brown centre; postmedial line slight, dark brown, defined on outer side by yellowish except towards costa, strongly bent outwards below costa, then waved, incurved below vein 4, and with a slight brown shade before it towards inner margin, some white points beyond it on costa, and slight black-brown streaks above and below vein 6 and between veins 4 and 2; cilia intersected by slight white streaks. Hind wing pure white, the terminal area slightly tinged with brown. Underside white.

♀. More strongly tinged with reddish brown; fore wing with round whitish orbicular stigma and some fiery red on outer edge of reniform and on the yellowish beyond the postmedial line; hind wing suffused with reddish brown; underside tinged with red-brown.

1908: Oct. 13,—1 ♀ (type); Nov. 24,—1 ♂ (type). **1909**: Mar. 12,—1 ♀; Apr. 14,—1 ♀; Apr. 20,—1 ♀; Apr. 22,—1 ♀; Apr. 26,—1 ♀; Sept. 30,—1 ♀; Oct. 22,—1 ♀; Nov. 6—1 ♀. *Exp.* 32–36 millim.

3878. Laphygma exigua Hübn.

1909: Jan. 15,—1 ♂, 1 ♀.

Genus Odontoretha, nov.

Type, *O. featheri*.

Proboscis fully developed; palpi porrect, short, slender; frons with large, conical, truncate prominence with raised edges produced to two minute teeth below and two at each side; eyes large, round; antennæ of male almost simple; thorax clothed almost entirely with scales, the metathorax with depressed crest; build slender; tibiæ slightly fringed with hair; abdomen clothed with rather rough hair, but without crests. Fore wing long and very narrow; the apex rectangular, the termen evenly curved and not crenulate; veins 3, 4 stalked; 5 from just above angle;

6 from well below upper angle; 7, 8, 9, 10 stalked; 11 from cell. Hind wing with the cell long; veins 3, 4 stalked; 5 obsolescent from just below middle of discocellulars; 6, 7 shortly stalked; 8 anastomosing with the cell near base only.

In key differs from *Prometopus* in the frontal prominence being toothed at edges and the fore wing having veins 3, 4 stalked.

3880 *a*. ODONTORETHA FEATHERI, sp. n. (Pl. I. fig. 7, ♂.)

♂. Head white, antennæ tinged with fuscous; frons with black bars at sides; palpi mostly black; thorax and abdomen grey-white mixed with some blackish; pectus, legs, and ventral surface of abdomen white, the tarsi black ringed with white. Fore wing grey-white, the terminal half with black scales mixed except a patch in and just beyond the cell from costa to vein 2; the darker area defined on inner side by a faint oblique medial line angled outwards just below the cell, with a black streak in the cell from it to the pale patch, which is somewhat constricted at discal fold. Hind wing white; a brown discoidal striga and some faint striæ on termen except towards tornus; the underside with some black on costa towards base, a rather diffused black mark on vein 8 just beyond the cell, and the costal area slightly irrorated with black towards apex.

1909: Mar. 12,—1 ♂ (type). *Exp.* 24 millim.

3989. ATHETIS LEUCONEPHRA Hmpsn.

1908: Sept. 24,—1 ♀; Sept. 27,—1 ♀; Oct. 13,—1 ♀.

3998 *a*. ATHETIS DISCOPUNCTA, sp. n. (Pl. I. fig. 8, ♀.)

♀. Head and thorax creamy white irrorated with rufous and a few black-brown scales; antennæ brown except at base; palpi tinged with red-brown towards tips; abdomen whitish suffused with red-brown. Fore wing white irrorated with pale red-brown and a few black-brown scales; small subbasal, antemedial, and postmedial black spots on costa; a black point just beyond the cell; traces of a postmedial line formed by red-brown and black scales arising from the costal spot, excurved from below costa to vein 4, then incurved; some minute blackish streaks on postmedial part of costa; subterminal line represented by slight blackish streaks and spots except towards costa; the terminal area tinged with rufous except at apex; a series of small black spots just before termen; cilia rufous at base, chequered rufous and white at tips. Hind wing white, the termen tinged with rufous except towards apex. Underside white, the costal and terminal areas of fore wing and apex of hind wing irrorated with rufous.

1909: Sept. 11,—1 ♀ (type). *Exp.* 28 millim.

4020 *a*. ATHETIS ECTOMELÆNA, sp. n. (Pl. I. fig. 9, ♂.)

♂. Head and thorax ochreous; antennæ brownish; palpi blackish at sides; tibiæ irrorated with blackish, the tarsi blackish with pale rings; abdomen ochreous white with diffused fuscous dorsal bands. Fore wing ochreous; a minute black subbasal spot on costa and slight point below the cell; a small black antemedial spot on costa, and traces of a sinuous line with slight black marks on it below the cell and above inner margin; two small black spots at middle of costa; a black subterminal band, broad at costa and narrowing to a point at inner margin, extending, except towards apex and tornus, to beyond the slight pale subterminal line, which is slightly angled outwards at vein 7 and excurved at middle; the termen ochreous with a series of minute black lunules; cilia whitish, tinged with brown at base. Hind wing white, with a slight brown terminal line except towards tornus; cilia ochreous at base, white at tips, and with a brown line through them towards apex. Underside white, the fore wing and costa of hind wing tinged with ochreous; fore wing with the terminal area suffused with fuscous except towards tornus; the cilia ochreous at base followed by a brown shade and the tips white; hind wing with some brown on apical part of termen.

1908: Oct. 20,—1 ♂ (type). *Exp.* 30 millim.

Genus CONSTANTIODES, nov.

Type, *C. pyralina*.

Proboscis absent; palpi upturned, the 2nd joint reaching to vertex of head, slenderly scaled, the 3rd moderate, thickly scaled; frons smooth, with ridge of hair above; eyes large, round; antennæ of male bipectinate with moderate branches, the apex ciliated; thorax clothed almost entirely with scales, the metathorax with depressed crest; tibiæ slightly fringed with hair; abdomen with dorsal crest at base only. Fore wing narrow, the apex rectangular, the termen evenly curved, crenulate; veins 3 and 5 from near angle of cell; 6 from upper angle; 9 from 10 anastomosing with 8 to form a narrow areole; 11 from cell. Hind wing with veins 3, 4 from angle of cell; 5 obsolescent from below middle of discocellulars; 6, 7 from upper angle; 8 anastomosing with the cell near base only.

In key differs from *Plusilla* in the fore wing being narrow with the termen crenulate.

4030 *a*. CONSTANTIODES PYRALINA, sp. n. (Pl. I. fig. 35, ♂.)

♂ ♀. Head and thorax white mixed with some red-brown; palpi with some dark brown towards extremity of 2nd joint; abdomen creamy white, dorsally tinged with brown. Fore wing creamy white tinged in parts with brown and slightly irrorated with black, the termen yellowish tinged with rufous; a slight curved blackish subbasal line from costa to vein 4; antemedial line reddish brown defined on inner side by white, oblique to submedian fold, then almost obsolete; some white in end of cell; reniform slightly defined by red-brown, large, somewhat angled inwards on median nervure, a red-brown shade beyond it from costa beyond the postmedial line followed by some white; postmedial line blackish, oblique towards costa, then slightly waved, at vein 3 retracted to inner edge of reniform, then oblique to inner margin, the veins beyond it with slight black streaks except towards costa; some oblique white and dark striæ on costa towards apex; subterminal line white, slightly waved from below costa to vein 4, then oblique; some rufous at apex; a waved blackish terminal line. Hind wing creamy white; a slight waved brown terminal line; the underside with the apical area irrorated with a few red-brown scales.

1908: June 1,—1 ♀ (in B.M.); Sept. 21,—1 ♂ (type). **1909**: Mar. 11,—1 ♀; Apr. 7,—1 ♂. *Exp.* 22 millim.

4103 *a*. ETHIOPICA IGNECOLORA, sp. n. (Pl. I. fig. 10, ♀.)

Antennæ of female bipectinate.

♀. Head and thorax fiery rufous; antennæ black; pectus and legs rufous; tarsi dark brown ringed with white; abdomen ochreous brown, the ventral surface whitish tinged with rufous. Fore wing fiery rufous; traces of a curved deeper red antemedial line; a whitish point in middle of cell; reniform defined by whitish points; postmedial line indistinct, deep red, oblique towards costa, then slightly waved, excurved to vein 4, then incurved; some slight whitish points beyond it on costa; subterminal line represented by a slight whitish striga from costa and whitish points above and below vein 6 further from termen; a terminal series of slight whitish points. Hind wing white, the costal area, and terminal area to vein 2, tinged with pale brown. Underside of fore wing brownish white, the costal area red; hind wing with the costal edge red.

1909: Dec. 15,—1 ♀ (type). *Exp.* 26 millim.

4103 *b*. ETHIOPICA PHLEOCAUSTA, sp. n. (Pl. I. fig. 11, ♀.)

♀. Head, thorax, and abdomen deep purplish red tinged with brown; antennæ black; palpi black-brown except at tips; tarsi black-brown with slight pale rings. Fore wing deep purplish red tinged with brown; a very indistinct sinuous brownish antemedial line; reniform red incompletely defined by ochreous, narrow; postmedial line indistinct, dark, oblique to vein 6, then dentate and incurved below vein 4, some minute pale points beyond it on costa, a terminal series of ochreous points. Hind wing white tinged with brown, the cilia pure white at tips. Underside of fore wing pale brown; hind wing white, the costal half suffused with brown.

1909: May 9,—1 ♀ (type); May 10,—1 ♀. *Exp.* 26 millim.

4524. ELYDNA BISIGNATA Hmpsn.

1909: May 12,—1 ♀.

4676 *a*. **Rabila albiviridis**, sp. n. (Pl. I. fig. 13, ♂.)

Antennæ of male laminate and minutely ciliated.

♂, ♀. Head, thorax, and abdomen white slightly mixed with brownish; antennæ tinged with ochreous. Fore wing pale yellow-green irrorated with white, the costal area whiter to beyond middle. Hind wing white tinged with brown. Underside white; fore wing suffused with brown, except the costa and inner area which are irrorated with brown; hind wing with the costal and terminal areas irrorated with brown.

Ab. 1. ♀. Fore wing with deeper green patch with a golden tinge and defined by whitish on inner basal area, its outer edge rounded and a similar small round spot distinctly defined by white before tornus.

1908: May 28,—1 ♀; June 2,—1 ♂; June 21,—1 ♂ (type). **1909**: Apr. 6,—1 ♀; Apr. 8,—1 ♂; Apr. 22,—1 ♂; Apr. 23, —1 ♀; May 8,—1 ♀ (B.M.); May 10,—2 ♂; Sept. 16,— 1 ♀ ab. (B.M.). Year ? : May,—1 ♂. *Exp.* 20–24 millim.

4742 *a*. **Acrapex albicostata**, sp. n. (Pl. I. fig. 14, ♂.)

♂. Head whitish mixed with dark brown, the antennæ ringed with brown towards base, thorax white tinged with red-brown, the tegulæ with slight brown medial line; pectus, legs, and abdomen white, the fore legs brown in front. Fore wing white tinged and irrorated with red-brown, the costal edge brown, the inner half dark brown to the postmedial line, extending except at base to discal fold and leaving some yellow on inner margin, met at the postmedial line by an oblique brown fascia from termen below apex; subbasal and antemedial slight double oblique brown striæ from costa; a black point in middle of cell and slight striga on discocellulars with point beyond it; postmedial line slight, brown, strongly bent outwards below costa, then slightly waved, excurved to vein 4, then incurved and double towards inner margin, the area beyond it with black streaks between veins 8 and 4; an oblique slightly waved brown subterminal line below the oblique fascia; a terminal series of black points. Hind wing pure white. Underside white, the costal area of fore wing tinged with ochreous and irrorated with red-brown.

1908: Sept. 26,—1 ♂ (type). *Exp.* 22 millim.

4755. **Sesamia coniota** Hmpsn.

1909: Jan. 12,—1 ♀.

Genus Pachycoa.

Type, *P. olivacea*.

Proboscis fully developed; palpi obliquely upturned, slender, the 2nd joint reaching to about vertex of head and slightly fringed with hair behind at extremity, the 3rd short and thickly scaled; frons with flattened corneous plate at middle covered by a tuft of hair above and corneous plate below; eyes rather small, round; antennæ of female somewhat laminate and almost simple; thorax thickly clothed with rough scales and hair, the metathorax with spreading crest; tibiæ slightly fringed with hair; abdomen without crests. Fore wing thickly clothed with rough scales, the apex rounded, the termen evenly curved and not crenulate; veins 3 and 5 from near angle of cell; 6 from below upper angle; 7 from angle; 8, 9, 10 stalked; 11 from cell. Hind wing with veins 3, 4 very shortly stalked; 5 somewhat obsolescent from well below middle of discocellulars; 6, 7 from upper angle; 8 anastomosing with the cell near base only.

In key differs from *Xantholepis* in the abdomen being without crests.

4824 *a*. PACHYCOA OLIVACEA, sp. n. (Pl. I. fig. 12, ♀.)

♀. Head whitish tinged with olive-brown and the frontal tuft with rufous; antennæ and palpi brown; thorax olive-brown, the metathoracic crest darker brown; abdomen olive-brown; pectus, legs, and ventral surface of abdomen whitish suffused with brown. Fore wing olive-brown with a reddish tinge except on terminal area; the 1st line almost medial, slight, whitish, oblique to subcostal nervure, then erect; postmedial line slight, whitish, excurved to vein 4, then oblique; cilia whitish tinged with brown and chequered with chocolate-brown at tips. Hind wing dark brown, the cilia silvery white at tips. Underside brown, the costal and terminal areas of fore wing and the hind wing irrorated with white.

1909: Sept. 16,—1 ♀ (type). *Exp.* 22 millim.

Genus ACRORIESIS, nov.

Type, *A. ignifusa*.

Proboscis fully developed; palpi obliquely upturned, slender, the 2nd joint reaching to above vertex of head, the 3rd short, thickly scaled; frons with flattened corneous plate at middle covered by a tuft of hair above and corneous plate below; eyes large, round; antennæ of female somewhat laminate and almost simple; thorax clothed with scales and hair mixed, the metathorax with spreading crest; tibiæ slightly fringed with hair; abdomen without crests. Fore wing with the apex rounded, the termen evenly curved and not crenulate; veins 3 and 5 from near angle of cell; 6 from upper angle; 7, 8 and 9, 10 stalked; 11 from cell. Hind wing with veins 3, 4 from angle of cell; 5 somewhat obsolescent from well above angle; 6, 7 from upper angle; 8 anastomosing with the cell near base only.

In key differs from the other genera without an areole in the fore wing having veins 7, 8 and 9, 10 stalked.

4824 *b*. ACRORIESIS IGNIFUSA, sp. n. (Pl. I. fig. 6, ♀.).

♀. Head and thorax whitish suffused with cupreous red; pectus and legs white, the latter tinged with brown; abdomen brown, the ventral surface white tinged with rufous towards extremity. Fore wing pale grey-brown suffused with cupreous red to the postmedial line except towards base; a subbasal chocolate-brown spot on inner margin and streak in end of cell; postmedial line double, brown filled in with white, very oblique from costa to vein 6 towards termen, then excurved to vein 4, then very inwardly oblique, with fiery red beyond it, except between veins 6 and 4, followed by a white line; cilia with fine whitish line at base and white tips. Hind wing white tinged with brown, the cilia pure white. Fore wing grey-brown, the costa white towards apex; hind wing white with small brown discoidal spot and curved postmedial line.

1909: Sept. 16,—1 ♀ (type). *Exp.* 18 millim.

4857 *a*. EUTERPIODES PICTIMARGO, sp. n. (Pl. I. fig. 15, ♂.)

Antennæ of male laminate and almost simple.

♂. Head and tegulæ bright rufous; thorax ochreous; fore and mid tibiæ and the tarsi red-brown ringed with white; abdomen ochreous white, the 2nd to 4th segments dorsally tinged with red-brown. Fore wing ochreous white, the area beyond the antemedial line from costa to below the cell and vein 3 suffused with bright rufous to termen; subbasal line black with some rufous before it on costa, sinuous, from costa to submedian fold; antemedial line black, oblique, sinuous, incurved above vein 1; claviform defined by red-brown at extremity; orbicular defined by red-brown, round; reniform with whitish centre and annulus defined by red-brown; a sinuous red-brown medial line; postmedial line black, slightly defined on outer side by white on the rufous area, strongly bent outwards below costa, slightly incurved at discal fold, incurved below vein 4 to below end of cell and excurved above vein 1, some white points beyond it on costa; subterminal line slight, white, defined on inner side by small rather dentate black marks from costa to vein 3, angled outwards at veins 7, 6 and inwards at discal fold, then minutely dentate, a crimson patch beyond it at apex with oblique black striga from apex; a terminal series of minute black lunules defined on inner side by white, more strongly towards apex; cilia pale rufous with a reddish-brown line near base. Hind wing silky white; the underside with the costal area irrorated with red-brown and with faint red-brown postmedial shade from costa.

♀. Thorax, abdomen, and the basal and inner areas of fore wing tinged with rufous; hind wing red-brown, the cilia whitish.

1908: Aug. 15,—1 ♀; Sept. 26,—1 ♂ (type). **1909**: Mar. 15,—1 ♂; Apr. 8,—1 ♀ (type). *Exp.* ♂ 20, ♀ 22 millim.

4857 *b*. EUTERPIODES CROCEISTICTA, sp. n. (Pl. I. fig. 16, ♂.)

♂. Head and thorax creamy white; frons and palpi tinged with orange, the latter with some black at side of 2nd joint; patagia with orange patches; fore and mid tibiæ tinged with orange, the tarsi orange ringed with white; abdomen white, suffused with dark brown except at base and extremity. Fore wing creamy white; antemedial line represented by orange striæ from costa and inner margin, a black point above submedian fold and orange point below it, inwardly oblique; postmedial line represented by an orange striga from costa, black points above and below vein 5, and below the end of cell by a black point above submedian fold, black and orange point below it, and orange striga from inner margin. Hind wing silky white with a very faint brown tinge. Underside of fore wing suffused with brown.

1909: Mar. 26,—1 ♂ (type); May 8,—1 ♀; May 10,—1 ♂. *Exp.* 14 millim.

4885 *a*. PARATUERTA NANA, sp. n. (Pl. I. fig. 17, ♂.)

♀. Head and thorax white with some brown scales; antennæ ringed with brown towards base; abdomen white dorsally irrorated with brown, the double basal crest with some blackish scales with a metallic gloss. Fore wing white irrorated with brown, the terminal area more thickly irrorated; a sinuous black-brown streak in submedian fold to the postmedial line, with the area below it and also the area from just before the postmedial line to the subterminal line chocolate-brown mixed with grey; antemedial line hardly traceable to submedian fold, then blackish and strongly angled outwards above inner margin; a faint diffused reddish-brown spot in end of cell almost conjoined to a similar discoidal spot; postmedial line black-brown, obliquely curved and slightly waved from costa to the streak in submedian fold where it terminates, the brown before it angled inwards at discal fold; subterminal line black-brown, obliquely curved and slightly waved, angled inwards at vein 1; a fine dark terminal line. Hind wing ochreous yellow, the inner area tinged with reddish brown; the postmedial area reddish brown to near termen, which is yellowish irrorated with brown; a terminal series of brown striæ. Underside of both wings white, the terminal areas broadly suffused with brown, the costal area of fore wing irrorated with brown.

♂. Fore wing with the costal area and disk grey irrorated with brown and hardly paler than the inner and terminal areas, the orbicular and reniform defined by dark brown, the latter faintly on outer side, the former round; hind wing brownish ochreous.

1909: Apr. 11,—1 ♂ (type); Apr. 30,—1 ♀ (type). *Exp.* ♂ 26, ♀ 30 millim.

Subfam. ERASTRIANÆ.

5068 *b*. ENISPA FLAVIPARS, sp. n. (Pl. I. fig. 18, ♂.)

♂. Head and thorax rufous; pectus, legs, and abdomen whitish tinged with brown, the last with some rufous at base of dorsum. Fore wing irrorated with silvery scales, the costal half rufous to beyond the cell, the rest of wing pale olive-green banded with pale yellow; an indistinct interrupted antemedial band; a small brown spot in middle of cell and curved discoidal striga; the postmedial line dark and bent outwards below costa with a yellow spot before it at costa, a yellow spot at discal fold and incurved band from vein 4 to inner margin, some yellowish points beyond it on costa; an interrupted maculate subterminal yellowish band. Hind wing irrorated with silvery scales, pale olive-green with the terminal area pale yellow; the underside pale yellow.

1908: Oct. 31,—1 ♂ (type). **1909**: Mar. 12,—1 ♂. *Exp.* 16 millim.

5142. EUBLEMMA ADMOTA Feld.

1909: Oct. 11,—1 ♀.

5144. EUBLEMMA REDUCTA Butl.

1908: June 1,—1 ♂; Oct. 13,—3 ♂; Oct. 23,—1 ♂; Nov. 17, —1 ♂. **1909**: May 8,—1 ♀; May 10,—1 ♂, 1 ♀.

5149. EUBLEMMA NIGRIVITTA Hmpsn.

Mandera.—1908: Sept. 20,—1 ♂; Oct. 11,—1 ♂. **1909**: Mar. 12,—1 ♂; Mar. 26,—1 ♂.

Hargaisa.—1908: Oct.,—1 ♂.

5158 *a*. EUBLEMMA EREMOCHROA, sp. n. (Pl. I. fig. 19, ♂.)

♂. Head, thorax, and abdomen ochreous slightly tinged with rufous; antennæ tinged with fuscous; palpi and fore legs blackish. Fore wing ochreous tinged and irrorated with rufous and with a few blackish scales; the costal edge blackish towards base; traces of a waved rufous antemedial line; minute black points in middle of cell and on discocellulars sometimes present; traces of a rufous medial line, oblique to the discocellulars, then inwardly oblique; postmedial line indistinct, rufous, oblique towards costa, then inwardly oblique, very slightly waved and sometimes with some blackish scales on it; some faint pale and rufous marks on costa towards apex; an oblique rufous subterminal shade with a series of minute white points on it, sometimes with some black scales on their outer edges and with one to three black points towards costa; a terminal series of black points with more prominent spot at submedian fold. Hind wing white with a faint rufous tinge; traces of a sinuous rufous postmedial line; a punctiform blackish terminal line. Underside of fore wing suffused with red-brown except the marginal areas; hind wing with the costal area irrorated with rufous.

♀. Fore wing more strongly suffused with rufous, the white points on the subterminal line usually obsolete; hind wing more strongly tinged and irrorated with rufous.

1908: July 19,—1 ♀; July 31,—2 ♂. **1909**: Jan. 9,—1 ♀;

Jan. 14,—1 ♂ ; Jan. 15, —1 ♀ ; Jan. 17, —1 ♀ ; Jan. 18,—1 ♂ (type) ; Jan. 19,—1 ♂, 1 ♀ (type) ; Mar. 30,—1 ♂. *Exp.* 18–22 millim.

5214. Eublemma scitula Rmbr.

1908 : June 29, —1 ♀ ; Sept. 16,—1 ♀ ; Sept. 17,—1 ♀ ; Oct. 28, —1 ♀ ; Nov. 17,—1 ♂ ; Nov. 19,—1 ♂. **1909** : Jan. 19,—1 ♀ ; Feb. 22,—1 ♀ ; Mar. 13,—1 ♂.

5282 *a*. Eublemma ochricosta, sp. n. (Pl. I. fig. 20, ♀.)

♀. Head white, the antennæ tinged with ochreous, the palpi with grey-brown ; thorax whitish tinged with grey-brown ; pectus and legs white, the fore legs tinged with grey-brown, the mid and hind legs with ochreous ; abdomen ochreous white. Fore wing ochreous white suffused and irrorated with grey-brown, the costal area broadly ochreous ; black points in cell towards extremity and on discocellulars with a slight white streak between them ; some very slight white streaks in the interspaces of terminal area, the streak in discal fold extending to near end of cell. Hind wing white with an ochreous tinge.

1909 : Feb. 23,—1 ♀ (type). *Exp.* 18 millim.

5282 *b*. Eublemma arenostrota, sp. n. (Pl. I. fig. 21, ♂.)

♂. Head white, the antennæ and palpi tinged with ochreous ; thorax whitish mixed with grey-brown ; pectus, legs, and abdomen white tinged with ochreous. Fore wing ochreous irrorated with white and grey-brown except on terminal area, the ochreous forming diffused fasciæ on median nervure and above vein 2 to the oblique grey-brown subterminal shade ; the costal edge white ; minute brown spots on each side of discocellulars ; some slight brown points on termen ; cilia white and grey-brown with a fine white line at base. Hind wing white slightly tinged with ochreous. Underside of both wings almost pure white.

1909 : Jan. 20,—1 ♂ (type). *Exp.* 20 millim.

5296. Eublemma conistrota Hmpsn.

1908 : Aug. 24,—1 ♀.

5320 *a*. Toana nigrilineata, sp. n. (Pl. I. fig. 22, ♂.)

♂ ♀. Head, thorax, and abdomen pale grey-brown ; antennæ ringed with black ; palpi, frons, and fore legs black-brown. Fore wing pale brownish grey slightly irrorated with dark brown ; a small subbasal black spot on costa ; antemedial line strong, black, oblique to submedian fold, then incurved to inner margin ; a slight brownish medial line, excurved beyond lower angle of cell and above inner margin ; postmedial line strong, black, arising from the same point on costa as the medial line, oblique and sinuous to vein 4, then inwardly oblique to submedian fold and excurved above inner margin ; traces of a brownish subterminal line; a strong slightly waved black terminal line; cilia with fine brown lines through them. Hind wing whitish tinged and irrorated with brown; postmedial line almost obsolete on costal half, then black, oblique to vein 4, then inwardly oblique to submedian fold and oblique to inner margin; a black terminal line. Underside whitish tinged with red-brown; hind wing with slight brown discoidal striga.

1909: Mar. 22,—1 ♂ (type); Mar. 26,—1 ♀. *Exp.* 18 millim.

5576 *a.* CHIONOXANTHIA LEUCOPHÆA, sp. n. (Pl. I. fig. 23, ♂.)

♂ ♀. Head, thorax, and abdomen grey-white mixed with brown; palpi black-brown ringed with white. Fore wing grey-white suffused with brown; a slight sinuous blackish subbasal line from costa to submedian fold; antemedial line double, blackish filled in with white and defined on inner side by white, sinuous, a black streak beyond it in submedian fold; orbicular white defined by black, round, some black in the cell between it and the white discoidal bar; postmedial line brown defined on each side by white, obliquely excurved from costa to vein 4, then incurved; subterminal line whitish defined on inner side by diffused brown forming a dark patch on costal area, angled inwards at discal fold, excurved at middle, then incurved and slightly waved; a terminal series of blackish striæ. Hind wing whitish suffused with brown; the underside white irrorated with brown, a small brownish discoidal spot, curved postmedial line, a diffused subterminal line.

1908: May 28,—2 ♀ (1 in B.M.); June 1,—1 ♂ (type); June 2,—1 ♀. *Exp.* 16 millim.

5589 *a.* ŒDICODIA STRIGIPENNIS, sp. n. (Pl. I. fig. 24, ♂.)

♂. Head and thorax red-brown slightly mixed with whitish; antennæ dark brown; palpi at base and the base of 3rd joint white; abdomen grey irrorated with brown; pectus and ventral surface of abdomen white tinged with brown. Fore wing red-brown tinged with grey and irrorated with blackish forming obscure streaks on the veins and above and below submedian fold, except on the terminal area which is slightly paler except at middle and tornus; an indistinct waved brown antemedial line, double at costa; a black discoidal striga with point above it on costa; postmedial line brown, defined on inner side by whitish towards costa, oblique to vein 6, then slightly waved and incurved below vein 4; the postmedial area rather darker brown with some whitish points on costa; subterminal line white defined on inner side by brown, very slightly excurved below vein 7 and at middle; a terminal series of minute black lunules. Hind wing pale red-brown, the cilia white tinged with red-brown at base; the underside white, the costal and terminal areas irrorated with brown, the apex suffused with brown, traces of sinuous postmedial and subterminal lines.

1908: Oct. 15,—1 ♂ (type). *Exp.* 20 millim.

5589 *b*. ŒDICODIA LIMBATA Butl.

1908: Apr. 28,—1 ♂; May 2,—1 ♀; May 4,—2 ♀; July 16,—1 ♀ (B.M.); July 17,—1 ♂; July 24,—1 ♀; Aug. 15,—1 ♂, 1 ♀; Sept. 13,—1 ♀; Sept. 15,—1 ♀; Sept. 16,—1 ♀; Sept. 23,—1 ♀; Sept. 25,—1 ♀; Sept. 26,—1 ♀; Sept. 27,—1 ♂, 1 ♀; Sept. 29,—1 ♀; Sept. 30,—1 ♀; Oct. 1,—1 ♀; Oct. 3,—1 ♂; Oct. 4,—1 ♀ (B.M.); Oct. 11,—1 ♀; Oct. 13,—1 ♂; Oct 14,—1 ♀; Oct. 18,—1 ♀ (B.M.); Nov. 17,—1 ♀. **1909**: Jan. 17,—1 ♀; Jan. 19,—1 ♂ (B.M.); Feb. 22,—1 ♂; Mar. 10,—1 ♀; Mar. 11,—1 ♂; Apr. 8,—1 ♂, 1 ♀; Apr. 10,—1 ♂. 1 ♀; May 8,—1 ♂ (B.M.); Nov. 23,—1 ♂. **1910**: Jan. 12,—1 ♀.

5589 *c*. ŒDICODIA MELANOGRAPHA, sp. n. (Pl. I. fig. 25, ♀.)

♀. Head, thorax, and abdomen pale red-brown; antennæ blackish; palpi except at tips, pectus, legs, and ventral surface of abdomen white, the fore and mid tibiæ tinged with brown, the tarsi brown ringed with white. Fore wing pale red-brown; a black point on costa near base, some scales in base of submedian fold and a slight patch of scales on the costa before the antemedial line, which is black, waved; a black discoidal striga, its lower extremity touching the sinuous blackish medial line, which is excurved to lower angle of cell; postmedial line blackish, approximated to the medial line, slightly waved, oblique to vein 5, then inwardly oblique; subterminal line rather diffused, black, very slightly excurved below vein 7 and at middle; some black scales on termen. Hind wing pale red-brown, the termen rather darker red-brown to vein 2; cilia white slightly tinged with rufous. Underside white tinged with rufous.

1909: Apr. 10,—1 ♀ (type). *Exp.* 24 millim.

5633 *a*. OZARBA SEMITORRIDA, sp. n. (Pl. I. fig. 26, ♂.)

♂. Head ochreous brown; thorax red mixed with leaden grey-brown; abdomen pale ochreous; palpi, pectus, legs, and ventral surface of abdomen white, the fore and mid tibiæ and tarsi banded with brown. Fore wing deep red suffused with dark leaden grey, especially towards costa, to the reniform and postmedial line, the rest of wing white tinged with red-brown and with a red patch on postmedial part of costa; minute subbasal white points on costa, in and below the cell; traces of a waved antemedial line defined on inner side by a whitish striga from costa; a white point in middle of cell; reniform white with pale brownish centre, narrow and oblique; postmedial line treble, red-brown filled in with white, obliquely excurved from costa to vein 4, then incurved, touching the upper and lower extremities of the reniform, three white points beyond it on the costal patch; subterminal line white defined on inner side by brown, excurved below vein 7 and at middle; a dark brown terminal line; cilia with brown shades at discal and submedian folds. Hind wing whitish suffused with reddish brown, the cilia whiter. Underside whitish tinged with red-brown except on inner area of hind wing.

♀. Head, thorax, and basal half of fore wing much redder, sometimes crimson-red and with the markings of outer half of fore wing crimson-red.

1908: Sept. 22,—1 ♂; Sept. 30,—1 ♀ (type); Oct. 18,—1 ♀; Oct. 22,—1 ♂ (type). **1909**: Mar. 24,—1 ♀. *Exp.* ♂ 18, ♀ 20 millim.

5635 *a*. OZARBA ENDOSCOTA, sp. n. (Pl. I. fig. 27, ♀.)

♂ ♀. Head and thorax ochreous, the head between antennæ and patagia with deep red patches, the patagia with black-brown stripes above; antennæ dark brown; pectus and legs white, the fore legs dark brown in front, the tarsi dark brown ringed with white; abdomen white, dorsally suffused with brown. Fore wing with the basal half ochreous tinged with red-brown, the area below the cell suffused with dark brown except at base, the rest of wing grey-white irrorated with dark brown; slight brown marks on costa towards base; an oblique antemedial brown striga from costa and sinuous line from cell to inner margin defined on inner side by whitish and with short brown streaks before it in submedian fold and above inner margin; a brown spot in end of cell and whitish discoidal striga; a small black spot on costa above end of cell; postmedial line hardly traceable, excurved to vein 4, then incurved, some black suffusion beyond it on costa; subterminal line white, curved, a blackish patch beyond it at discal fold; a terminal series of minute blackish spots. Hind wing whitish strongly suffused with brown; the underside white irrorated with brown, the terminal area suffused with brown, a small blackish discoidal spot and curved postmedial line.

1908: Oct. 11,—1 ♀ (type); Nov. 22,—1 ♂. *Exp.* 20 millim.

5637. OZARBA CONSANGUIS Hmpsn.

1908: Oct. 17,—1 ♀; Oct. 25,—1 ♀. **1909**: Apr. 7,—1 ♀; Apr. 8,—1 ♀.

5637 *a*. OZARBA HEMIPYRA, sp. n. (Pl. I. fig. 28, ♀.)

♀. Head whitish mixed with blackish, the upper part of frons, antennæ, and palpi blackish, the last with whitish ring at extremity of 2nd joint; thorax black with some reddish scales; pectus and legs ochreous white, the fore legs with some black in front, the tarsi banded with blackish; abdomen reddish ochreous irrorated with black, the basal crest and a bar before the anal tuft black, the ventral surface ochreous. Fore wing black slightly mixed with red to the medial line, the rest of wing fiery rufous with a slight greyish tinge on terminal area; subbasal line black slightly defined by red, waved, from costa to submedian fold; antemedial line black slightly defined on inner side by red at costa and inner margin, waved; medial line closely approximated to the antemedial line, black slightly defined on outer side by white, incurved just below median nervure, a black point beyond it on costa; postmedial line only defined by a deeper rufous shade on its outer side, excurved to vein 4, then incurved, some whitish points beyond it on costa; subterminal line whitish defined on inner side by a deep rufous shade, excurved below vein 7 and at middle, then waved, some deep rufous beyond it at discal and submedian folds; a terminal series of minute deep rufous lunules. Hind wing whitish suffused with brown and with a fine brown terminal line; cilia paler. Underside of fore wing whitish suffused with brown and with some reddish ochreous at middle of costa; hind wing whitish irrorated with brown and with a small dark discoidal spot.

1908: Oct. 2,—1 ♀ (type). *Exp.* 20 millim.

5638. Ozarba hemimelena Hmpsn.

1909: Mar. 21,—1 ♀; Mar. 28,—2 ♀; Apr. 7,—1 ♂; Oct. 5,—1 ♀.

5639*a*. Ozarba hemisarca, sp. n. (Pl. I. fig. 29, ♂.)

♂. Head, thorax, and abdomen ochreous with a faint rufous tinge; palpi except at tips, pectus, legs, and ventral surface of abdomen white, the fore and mid tibiæ ochreous, the tarsi ochreous ringed with white. Fore wing with the basal half ochreous slightly tinged with rufous, the terminal half white slightly tinged with olive-brown; two slight rufous marks on costa towards base; traces of a waved rufous antemedial line with a small deep rufous spot at costa; a red-brown medial line, oblique and sinuous to lower angle of cell, then slightly incurved, with minute blackish spots on it at costa and upper angle of cell and with the area between it and the closely approximated white postmedial line rufous, this line oblique to vein 4, then incurved; subterminal line whitish, defined on inner side by brown towards costa, slightly angled inwards below costa and incurved below vein 3; a black-brown spot at apex and terminal series of points; cilia tinged with red except at apex. Hind wing ochreous white, the area beyond lower angle of cell with a reddish tinge, the termen tinged with brown towards apex; cilia white. Underside ochreous white.

1908: Nov. 19,—1 ♂ (type). *Exp.* 18 millim.

5639 *b*. Ozarba exolivacea, sp. n. (Pl. I. fig. 30, ♂.)

♂. Head and tegulæ pale reddish ochreous; antennæ brown; thorax white slightly tinged with brown; pectus and legs ochreous white, the fore tibiæ and the tarsi brown ringed with white; abdomen ochreous tinged with brown. Fore wing white irrorated with blackish scales, the terminal half faintly tinged with olive-green except at apex, the costa suffused with brown towards base; an indistinct double waved brownish antemedial line; an oblique dark brown medial shade diffused to the postmedial line and on postmedial costal area; reniform with rufous centre and white annulus, narrow, oblique, and constricted at middle, a whitish patch above it on costa; postmedial line double, dark, oblique towards costa, then excurved to vein 4, then incurved, three white points beyond it on costa; subterminal line whitish defined on inner side by brown, slightly excurved below vein 7 and at middle; a slightly waved brown terminal line; cilia with series of brown marks except at apex. Hind wing ochreous suffused with reddish brown especially towards termen. Underside white irrorated with brown; fore wing tinged with ochreous except the inner area.

♀. Head, thorax, and abdomen ochreous; fore wing with the basal half tinged with ochreous, the terminal half suffused with pale olive-green, the medial shade narrower and not diffused to the postmedial line except below the cell or on the postmedial costal area.

1908: Sept. 22,—1 ♀ (type); Oct. 15,—1 ♂ (type). *Exp.* 22 millim.

5639 *c*. OZARBA MESOZONATA, sp. n. (Pl. I. fig. 31, ♂.)

♂ ♀. Head, thorax, and abdomen white faintly tinged with brown; antennæ brown; palpi brown at sides except at extremities of 2nd and 3rd joints; tarsi black-brown ringed with white. Fore wing white, the basal area faintly tinged with brown, the terminal area suffused with rufous; two slight dark marks on costa near base; a broad chocolate-brown medial band edged by black lines defined by white, narrower towards costa and slightly constricted in the cell; some whitish points on costa and a brown patch on costal area before the faint brownish subterminal line, which is slightly excurved at middle; a terminal series of black striæ slightly defined on inner side by white; cilia dark brown irrorated with grey, white at apex. Hind wing ochreous white tinged with brown; a fine brown terminal line. Underside white tinged with reddish ochreous.

1908: Sept. 19,—1 ♀; Sept. 21,—1 ♂; Sept. 22,—1 ♀; Oct. 13,—1 ♂ (type). **1909**: Apr. 12,—1 ♀. *Exp.* 16–20 millim.

3639 *d*. OZARBA ENDOPLAGA, sp. n. (Pl. I. fig. 32, ♂.)

♂ ♀. Head and thorax ochreous white; antennæ brown; abdomen ochreous tinged with brown; palpi, pectus, legs, and ventral surface of abdomen white, the palpi tinged with brown towards base, the fore and mid tibiæ suffused with brown, the tarsi brown ringed with white. Fore wing creamy white suffused with rufous especially on terminal half; a large conical chocolate-brown patch defined by white on medial area from below costa to inner margin, with slight black streak above it on costa in the male; some whitish points on postmedial part of costa and some brown on costa before apex; a black-brown terminal line defined on inner side by pale yellow which expands towards costa; cilia dark brown with a greyish tinge. Hind wing white tinged with reddish brown especially in female, the cilia whiter. Underside ochreous white tinged with brown.

1908: Sept. 27, —1 ♀; Oct. 11, 1 ♀ (B.M.). **1909**: Apr. 19, —1 ♂ (type); Nov. 7,—1 ♀. *Exp.* 20 millim.

5656. OZARBA SANCTA Staud.

1908: June 29,—1 ♂.

5685. OZARBA PHÆA Hmpsn.

1908: Feb. 11,—1 ♂.

5713. AMYNA OCTO Guen.

1908: Jan. 30,—1 ♂. **1909**: Apr. 7,—1 ♂; Apr. 30,—1 ♀.

5718. AMYNA PUNCTUM Fabr.

1908: May 29,—1 ♂. **1909**: Mar. 14,—2 ♀; Apr. 6,—1 ♂, 1 ♀; June 25,—1 ♂.

5891. EUSTROTIA MIANOIDES Hmpsn.

1909: Apr. 7,—3 ♀.

5942*a*. EULOCASTRA ARGYROSTROTA, sp. n. (Pl. I. fig. 33, ♂.)

♂ ♀. Head and thorax ochreous slightly tinged with rufous; antennæ reddish brown; palpi brown except at tips; tibiæ and tarsi banded brown and white; abdomen brown with white segmental lines, the ventral surface ochreous white irrorated with brown. Fore wing with the basal half ochreous slightly tinged with rufous, the terminal half suffused with red-brown and black-brown and with patches of silver scales; slight subbasal and antemedial brown marks on costa and traces of a sinuous antemedial line with some silvery scales beyond it; a sinuous black medial line defining the inner edge of the dark area; an ochreous discoidal striga with some black before it; postmedial line black defined on outer side by ochreous, more strongly at costa, oblique from below costa to vein 6, slightly incurved at discal fold, oblique and slightly waved below vein 4, an oblique brown line beyond it towards costa; subterminal line represented by silver scales defined on inner side by blackish, forming diffused marks below costa and at middle, excurved below vein 7 and at middle; a terminal series of black striæ slightly defined on inner side by white; cilia with white patches at apex and discal fold. Hind wing whitish suffused with fuscous brown; the underside bluish white irrorated with fuscous brown, the terminal area more suffused with fuscous, a small blackish discoidal spot and curved postmedial line.

1908: Sept. 21,—1 ♀; Oct. 15,—1 ♀; Oct. 24,—1 ♂ (type). Year ?: Oct. 25,—1 ♂. *Exp.* 16 millim.

5984. LOPHORACHE FULVIRUFA Hmpsn.

1909: Apr. 5,—1 ♀.

6081. HOPLOTARACHE NUBILA Hmpsn.

1908: Sept. 21,—1 ♀.

6081 *a*. HOPLOTARACHE ECTORRIDA, sp. n. (Pl. I. fig. 36, ♂.)

Hoplotarache nubila, ab. 1, Hmpsn. Cat. Lep. Phal. B.M. x. p. 715.

♂. Head and thorax white, the dorsum of thorax with black scales mixed except in front; antennæ fuscous; palpi black at tips, the frons with lateral black bars; tarsi black ringed with white; abdomen creamy white with dorsal fuscous segmental bands, the ventral surface white. Fore wing white; subbasal line defined on each side by grey, sinuous, from costa to median nervure; grey streaks on costa and above vein 1 before the antemedial line, which is defined on each side by grey, waved, some grey beyond it below median nervure; small dark grey annuli in middle of cell and on discocellulars; an oblique dark grey striga from middle of costa, spot above median nervure and waved black line from cell to inner margin; an oblique dark grey postmedial striga from costa, two black striæ beyond the cell with some grey before them and a waved black line from lower angle of cell to inner margin; the terminal area chocolate-brown, leaving an oblique wedge-shaped white patch on costal area beyond the postmedial line and below the cell extending to the medial line; subterminal line white with two small wedge-shaped black marks before it below costa, excurved below costa and at middle, then incurved and slightly waved, and with black marks beyond it above and below vein 2; a terminal series of small black spots defined on inner side by white; cilia wholly white at middle, red-brown at base, with white tips towards apex and dark leaden-grey tips at discal fold and towards tornus and with slight blackish line through them. Hind wing white; the underside with brown spots at middle of costa and apex and postmedial bar from costa.

♀. Dorsum of thorax grey and black; abdomen red-brown; fore wing with more grey suffusion on the white area; hind wing red-brown, the cilia white at tips; the underside white suffused with brown, a brown discoidal bar and postmedial line excurved beyond the cell.

1908: Nov. 19,—1 ♀. **1909**: Apr. 6,—1 ♀; Apr. 8,—1 ♂, 1 ♀ (types); Apr. 9,—1 ♀; Apr. 10,—2 ♀; Apr. 14,—1 ♀; May 7,—1 ♀; May 9,—1 ♀.

Also in the British Museum from Br. E. Africa, Athi Valley (*Crawshay*), 1 ♂. *Exp.* 20 millim.

6081 *b*. HOPLOTARACHE CÆRULEOPICTA, sp. n. (Pl. I. fig. 37, ♂.)

♂. Head, thorax, and abdomen ochreous tinged with rufous; pectus, legs, and ventral surface of abdomen ochreous white, the fore and mid tibiæ and the tarsi brown ringed with white. Fore wing with the basal half creamy white, the terminal half olive-brown; subbasal line double, olive-brown, sinuous, from costa to vein 1; antemedial line double, olive-brown; a black point in middle of cell and incomplete black discoidal annulus slightly defined by white; medial line dark, defining the pale area, oblique to lower angle of cell, then incurved; an oblique wedge-shaped postmedial creamy-white patch from costa, then a diffused dark line, strongly incurved and with patches of silvery-blue scales beyond it; subterminal line interrupted in places, cupreous red defined on each side by creamy white, excurved to near termen below vein 7 and at middle, then slightly waved; a terminal series of black striæ defined by creamy white; cilia creamy white from vein 4 to submedian fold. Hind wing creamy white, the veins and terminal area tinged with brown; the underside creamy white, the terminal area tinged with brown, a small blackish discoidal spot and faint brownish medial and postmedial bars from costa.

♀. Fore wing with the basal half tinged with red-brown; hind wing cupreous red-brown, the cilia white at tips, the underside creamy white tinged with red-brown, the terminal area suffused with red-brown, a small dark discoidal spot and curved postmedial line.

1909: Apr. 9,—1 ♂; Apr. 15,—1 ♀ (type); Apr. 24,—1 ♂ (type). *Exp.* 22 millim.

6089. METAPIOPLASTA INSOCIA Wlk.

1908: May 4,—1 ♂.

6091 *a*. AULOTARACHE PLUMBEOGRISEA, sp. n. (Pl. I. fig. 34, ♀.)

♀. Head, thorax, and abdomen reddish ochreous, the patagia suffused with leaden grey; pectus, legs, and ventral surface of abdomen ochreous white, the fore legs tinged with red-brown. Fore wing brownish suffused with leaden grey; some ochreous and rufous on inner margin towards base; traces of a sinuous dark antemedial line from cell to inner margin, faintly defined on inner side by ochreous; claviform a very narrow ochreous mark defined by some black scales; orbicular on outer side and reniform on inner side very faintly defined by black; postmedial line dentate, indistinct and brown from below costa to vein 6, then blackish and defined on outer side by yellow and red patches in the interspaces, oblique below vein 4; a terminal series of minute black points defined on inner side by white points. Hind wing white, the costal and terminal areas tinged with brown. Underside of fore wing and costal area of hind wing suffused with reddish brown.

1908: Sept. 23,—1 ♂; Sept. 25,—1 ♀; Oct. 17,—1 ♀ (type); Oct. 24,—1 ♀. **1909**: Apr. 15,—1 ♀; Apr. 20,—2 ♀; May 9, —1 ♀ (B.M.); May 10,—1 ♀; May 12,—1 ♀. *Exp.* 22–26 millim.

6122. TARACHE ZELLERI Wllgrn.

1908: Sept. 18,—1 ♂.

6155. TARACHE UMBRIGERA Feld.

1908: May 24,—1 ♂. **1909**: Apr. 18,—2 ♀.

6167. TARACHE OPALINOIDES Guen.

Mandera.—**1908**: July 17,—1 ♀. **1909**: Apr. 9,—1 ♀; Apr. 10,—1 ♂; Apr. 27,—1 ♀.

Hargaisa.—**1908**: Oct.,—1 ♂, 1 ♀.

6175. TARACHE CARNESCENS Hmpsn.

1909: Oct. 22,—1 ♀.

6182. TARACHE HORTENSIS Swinh.

1908: Aug. 16,—1 ♀; Sept. 28,—1 ♀; Sept. 29,—1 ♂. **1909**: Apr. 7,—1 ♀; Apr. 8,—1 ♀; Nov. 24,—1 ♂.

6187 *a*. TARACHE MESOLEUCA, sp. n. (Pl. I. fig. 38, ♂.)

♂. Head, thorax, and abdomen white, the dorsum of thorax behind the tegulæ with grey mixed. Fore wing pale leaden grey, the basal area with some white mixed; a subbasal white point below costa and streak above base of vein 1; a waved white antemedial line; a white medial band; a black annulus in the cell towards extremity and rather elliptical discoidal annulus; a triangular white patch on postmedial part of costa with the faint diffused red-brown postmedial line arising from it, strongly incurved below vein 4; a very indistinct brownish subterminal line with some white on it at costa, incurved and with white scales on its outer edge below vein 3; a terminal series of black striæ defined on inner side by white on inner half; cilia with white mixed from vein 3 to submedian fold. Hind wing white, the costal area and termen, except towards tornus, tinged with brown; the underside white with small brown discoidal spot.

1908: Aug. 15,—1 ♂ (type). *Exp.* 18 millim.

6191 *a*. TARACHE MIOGONA, sp. n. (Pl. I. fig. 39, ♀.)

♀. Head grey-brown, the palpi white except at tips; thorax brownish white with fuscous scales mixed; pectus and legs white, the fore and mid tibiæ banded with fuscous, the tarsi black ringed with white; abdomen red-brown, the ventral surface white. Fore wing with the basal area brownish white with some red-brown scales towards costa and a grey tinge at base of inner margin, its outer edge rather oblique and diffused; a black point in the cell near base; the rest of wing chocolate-brown tinged with purplish grey; a conical brownish-white postmedial patch on costa with the blackish postmedial line arising from it, incurved below vein 4 to below end of cell and slightly angled outwards at vein 1; subterminal line formed by brownish-white scales, slightly waved, incurved below vein 3 and ending at tornus; a terminal series of black striæ; cilia with a slight dark line through them. Hind wing pale red-brown, the terminal area darker; cilia fuscous with a white line at base and white tips except towards tornus; the underside with white patch on costa towards apex.

1909: Apr. 10,—1 ♀ (type). *Exp.* 24 millim.

Subfam. EUTELIANÆ.

6258. EUTELIA DISCISTRIGA Wlk.

1909: Feb. 27,—1 ♀; Apr. 20,—1 ♀; June 12,—1 ♀.

6258 *a*. EUTELIA GRISESCENS, sp. n. (Pl. I. fig. 40, ♂.)

♂ ♀. Head, thorax, and abdomen grey, the thorax tinged with rufous; palpi with the base of 2nd and 3rd joints brown; tarsi brownish with pale rings; abdomen with some rufous on dorsum, the crests and anal tuft blackish. Fore wing with the basal area rufous defined by the deeper rufous antemedial line, which is angled outwards below costa, then incurved; the rest of wing grey; a faint reddish-brown medial line, bent outwards to the discocellulars and incurved below the cell; postmedial line black with some fuscous beyond it towards costa, oblique and slightly sinuous to vein 6, then almost obsolete and much interrupted, excurved at middle then incurved, some rufous beyond it at discal fold and in submedian interspace; a brownish patch on costal area with two white points at costa before the subterminal line, some yellowish rufous below and beyond it; subterminal line slight, whitish and somewhat waved, incurved below costa and vein 3; a terminal series of black striæ; cilia dark brown, chequered with white at base. Hind wing grey-white, the terminal area tinged with brown and with brownish streaks on the veins; a fine black terminal line; cilia chequered blackish and white; the underside with the costal area and terminal area to vein 2 tinged with rufous, a blackish discoidal point and punctiform postmedial line.

1909: Mar. 13,—1 ♂. **1910**: Mar. 14,—1 ♀; Mar. 16,—1 ♂ (type). *Exp.* ♂ 22, ♀ 26 millim.

Subfam. STICTOPTERINÆ.

6458. STENOSTICTA GRISEA Hmpsn.

1908: Aug. 15,—1 ♂, 2 ♀; Aug. 24,—1 ♀; Sept. 13,—1 ♀; Sept. 21,—1 ♂; Oct. 15,—1 ♂; Oct. 28,—1 ♀. **1909**: Feb. 13, —1 ♂; Mar. 14,—1 ♀; Mar. 22,—1 ♂; Mar. 28,—1 ♂.

Subfam. ACONTIANÆ.

6863. EARIAS INSULANA Boisd.

1908: Oct. 31,—1 ♂.

6980. MAURILIA ARCUATA Wlk.
1908: Oct. 25,—1 ♂.

7068. NEGETA LUMINOSA Wlk.
1908: July 11,—1 ♀.

7116. ACONTIA ALBAGO F.
1909: Apr. 24,—1 ♀; Apr. 26,—1 ♀.

7117. ACONTIA GEPHYRIAS Meyr.
1909: May 8,—1 ♂.

Subfam. CATOCALINÆ.

7353. ULOTHRICHOPUS TINCTIPENNIS Hmpsn.
1909: July 6,—1 ♂.

7362. CHELECALA TREFOLIATA Butl.
1910: Jan. 10,—2 ♀.

7367. HYPOTACHA INDECISA Wlk.
1908: July 24,—1 ♂; Aug. 26,—1 ♀.

7423. CYLIGRAMMA LATONA Cram.

1909: May 20,—1 ♀; May 21,—1 ♀; May 23,—1 ♂; May 29,—1 ♂; May 30,—1 ♀; May 31—3 ♂, 2 ♀; June 1, —8 ♂, 6 ♀; June 2,—2 ♀; June 4,—2 ♂; June 5,—1 ♀; June 6,—6 ♂, 4 ♀; June 7,—2 ♂, 1 ♀; June 9,—1 ♂, 8 ♀; June 14,—1 ♂; Sept. 8,—1 ♂. **1910**: June 4,—1 ♀.

7493 *a*. ACANTHONYX SERIOPUNCTA, sp. n. (Pl. I. fig. 41, ♂.)

♂. Head and thorax ochreous yellow, the tegulæ tinged with rufous; antennæ whitish tinged with rufous; abdomen ochreous white with dorsal rufous segmental lines, the ventral surface ochreous. Fore wing ochreous yellow sparsely irrorated with red-brown scales; subbasal red-brown points below costa and cell; a minute antemedial red-brown spot below costa and points on median nervure and vein 1; an oblique chocolate-brown discoidal bar tinged with grey, rather rounded above; a minute postmedial red-brown spot below costa, then a curved series of points on the veins; fine brownish lines on termen and through the cilia. Hind wing white. Underside white; fore wing with the costal area ochreous, the terminal area tinged with ochreous except towards tornus; hind wing with the costal area and the termen narrowly tinged with ochreous.

Hargaisa.—1908: Oct.,—1 ♂ (type). *Exp.* 40 millim.

7667. ACHÆA CATELLA Guen.

Mandera.—1908: Dec. 17,—1 ♀. **1909**: Jan. 9,—1 ♂; May 24,—1 ♀; May 25,—2 ♀; June 7,—1 ♂; July 9,—1 ♀.

Durbar.—1908: Dec. 6,—3 ♂.

7747. Parallelia algira L.

1909: Apr. 8,—1 ♂.

7764*a*. Parallelia rectifascia Fawcett.

1909: Apr. 22,—1 ♂.

7786. Grammodes stolida Fabr.

1908: May 4,—1 ♀; Aug. 28,—1 ♂; Sept. 11,—1 ♂; Sept. 12, —1 ♂; Sept. 23,—1 ♂; Sept. 25,—1 ♀; Sept. 30,—2 ♀; Oct. 1, —1 ♂. **1909**: Mar. 14,—1 ♂; Apr. 15,—1 ♀; Apr. 24,—1 ♀; May 9,—1 ♂, 4 ♀; May 10,—2 ♂, 5 ♀; May 12,—2 ♀; May 14, —1 ♂; May 21,—1 ♂. **1910**: Feb. 9,—1 ♀.

7792. Chalciope hyppasia Cram.

1908: Nov. 19,—1 ♂.

7855. Mocis repanda F.

1909: June 4,—1 ♂.

8075. Cerocala illustrata Holl.

Mandera.—1908: Feb. 11,—1 ♀; Apr. 28,—1 ♀; May 28,—1 ♀; June 30,—1 ♀; July 27,—1 ♀; July 31,—1 ♂; Aug. 23,—1 ♂; Aug. 26,—1 ♀; Sept. 22,—1 ♂; Oct. 22,—1 ♂; Nov. 13,—1 ♀; Nov. 25,—1 ♀. **1909**: Jan. 9,—2 ♀; Jan. 15,—1 ♀; Jan. 17,—3 ♀; Feb. 14,—2 ♀; Feb. 16,—1 ♀; Feb. 17,—2 ♀; Feb. 21,—1 ♂; Mar. 10,—1 ♀; Mar. 13,—2 ♀; Mar. 17,—3 ♀; Mar. 20,—1 ♂, 1 ♀; Mar. 21,—1 ♀; Mar. 22,—2 ♀; Mar. 24,—1 ♂, 1 ♀; Mar. 26,—4 ♀; Mar. 28,—1 ♀; Mar. 29,—1 ♀; Apr. 7, —1 ♀; Apr. 8,—2 ♂, 2 ♀; Apr. 10,—1 ♂, 2 ♀; Apr. 11,—3 ♂, 1 ♀; Apr. 14,—1 ♂, 1 ♀; Apr. 19,—1 ♀; May 8,—1 ♀; May 10, —1 ♂, 2 ♀; June 9,—1 ♂; Oct. 11,—1 ♂; Nov. 11,—2 ♀; Nov. 12,—2 ♀. **1910**: Mar. 14,—1 ♀.

Gan Libbah.—1908: June 24,—1 ♀.

Berbera.—1908: Mar. 4,—2 ♀.

8077 *a*. Cerocala albimacula, sp. n. (Pl. I. *fig.* 42, ♂.)

♂. Head, thorax, and abdomen brown mixed with white, the thorax mostly brown, the tegulæ dark brown, white at base and tips; antennæ ringed black and white; tarsi brown ringed with white; ventral surface of abdomen white. Fore wing whitish almost wholly suffused with grey-brown and reddish brown, leaving a rather quadrate white patch beyond the reniform; antemedial line obsolete on costal area, then double, black, slightly sinuous, with diffused silvery and black scales before it, the outer line slightly defined on outer side by white: orbicular and reniform with silvery and brown centres incompletely defined by black; the former small, round, the latter with dark streak before it in lower part of cell; postmedial line black slightly defined on inner side by whitish, excurved below costa and between veins 3 and 2 to the subterminal line, then retracted upwards to lower angle of cell, waved to vein 1 and oblique to inner margin, some black and silvery scales beyond it in its sinus; subterminal line whitish defined on inner side by black marks and some silvery scales between veins 7 and 3, angled outwards below vein 7 and excurved at middle; a waved dark terminal line; cilia chequered brown and white. Hind wing white suffused with reddish brown; a dark discoidal spot with some white beyond it: an indistinct dark subterminal shade with dark patches beyond it below apex and at middle with white above them; cilia white chequered with brown. Underside white; fore wing with round black discoidal spot, some brown suffusion from below end of cell and fuscous subterminal and terminal marks towards apex; hind wing with black discoidal spot, some brown suffusion from below end of cell to the sinuous brown postmedial shade, and blackish patches on termen below apex and at middle.

♀. Fore wing with more white, especially at base and on terminal area except at apex.

1908: Sept. 29,—1 ♀ (type); Oct. 11,—1 ♂ (type). **1909**: Apr. 7,—1 ♀; Apr. 20,—1 ♂; Oct. 5,—1 ♀; Oct. 14,—1 ♀. *Exp.* ♂ 28, ♀ 34 millim.

8078. Cerocala oppia Druce.

1908: Feb. 1,—1 ♂; Feb. 7,—1 ♀; Feb. 11,—1 ♂; Sept. 17,—1 ♀; Sept. 18,—1 ♀; Sept. 21,—3 ♀; Sept. 22,—1 ♀; Sept. 23,—1 ♀; Sept. 27,—1 ♂; Oct. 3,—1 ♀. **1909**: Feb. 23,—1 ♀; Mar. 1,—1 ♀; Mar. 11,—1 ♀; Mar. 14,—1 ♀; Mar. 19,—1 ♀; Mar. 22,—1 ♀; Mar. 26,—1 ♀; Apr. 6,—1 ♀; Apr. 7,—1 ♂; Apr. 8,—1 ♀; Sept.,—1 ♂; Oct. 5,—1 ♀; Nov. 6,—1 ♀. **1910**: Jan. 5,—1 ♀.

8092. Gnamptonyx innexa Wlk.

Mandera.—1908: July 17,—1 ♀; Sept. 19,—1 ♀. **1909**: Mar. 14,—1 ♂, 1 ♀; Mar. 28,—1 ♀; Mar. 29,—2 ♀; Apr. 8,—1 ♀. **1910**: Mar. 14,—1 ♀; Mar. 20,—1 ♀.

Hargaisa.—1908: Oct.,—1 ♀.

8117. Pericyma metaleuca Hmpsn.

1908: Aug. 24,—1 ♂. **1909**: May 10,—1 ♀.

8125. Cortyta leucoptera Hmpsn.

The series, besides the typical form, includes specimens agreeing with *C. dispar* Püng., *C. fasciolata* Warr., *C. balnearia* Dist., *C. impar* Hmpsn., and *C. eremochroa* Hmpsn., which are evidently forms of one variable species; they also occur together in the Hoggar Mts., S. Sahara, *vide* Rothschild, A. M. N. H. (8) xvi. p. 255 (1915).—G. F. H.

1908: Mar. 22,—1 ♂; July 8,—2 ♀; Aug. 20,—1 ♀ (B.M.); Sept. 16,—1 ♂; Sept. 19,—1 ♂, 1 ♀; Oct. 29,—1 ♂ (B.M.).

1909: Feb. 17,—1 ♀ (B.M.); Mar. 11,—1 ♀ (B.M.); Apr. 7, —1 ♀; Apr. 10,—1 ♀ (B.M.); Sept. 21,—1 ♂ (B.M.), 1 ♀; Sept.,—4 ♂; Oct. 14,—2 ♂ (1 in B.M.), 1 ♀; Oct. 22,—1 ♂; Dec. 28,—1 ♂. **1910**: Feb. 10,—1 ♀; Mar. 20,—1 ♂.

8132. CORTYTA ROSACEA Rebel.

1908: July 17,—1 ♀; Oct. 2,—1 ♀; Nov. 25,—1 ♂ (B.M.). **1909**: Mar. 14,—1 ♂; May 10,—1 ♀; Oct. 14,—1 ♀.

8135. CORTYTA CANESCENS Wlk.

Mandera.—1909: Apr. 14,—1 ♂.
Hargaisa.—1908: Oct.,—1 ♀.

Subfam. PHYTOMETRINÆ.

8292. PHYTOMETRA NI Hübn.

1908: Oct. 1,—1 ♀. **1909**: Apr. 6,—1 ♀; Sept.,—1 ♀.

8295. PHYTOMETRA LIMBIRENA Guen.

Hargaisa.—1908: Oct.,—1 ♂.

8330. PHYTOMETRA ACUTA Wlk.

1909: Mar. 30,—1 ♀; Apr. 6,—1 ♂; Apr. 29,—1 ♀; May 3, —1 ♂; May 21,—1 ♂.

Subfam. NOCTUINÆ.

PANDESMA ANYSA Guen.

1909: Apr. 6,—1 ♂.

POLYDESMA COLUTRIX Geyer.

1908: June 18,—3 ♀; July 2,—1 ♀; July 5,—2 ♂ (1 in B.M.); July 25,—1 ♀; July 26,—1 ♀; Aug. 1,—1 ♀. **1909**: July 13, —1 ♀.

PROCONIS ABROSTOLOIDES Hmpsn.

1909: Sept. 17,—1 ♀; Sept.,—1 ♀; Oct. 11,—1 ♀ (B.M.). **1910**: Feb. 10,—1 ♀.

AUTHADISTIS CAMPTOGRAMMA, sp. n. (Pl. I. fig. 44, ♂.)

Antennæ of male with fasciculate cilia.

♂ ♀. Head and thorax pale red-brown mixed with blackish and some whitish; palpi with some black towards base; pectus whitish; fore tibiæ with a black band, the tarsi black ringed with white; abdomen white tinged with reddish brown. Fore wing pale red-brown mixed with some whitish and irrorated with dark brown; subbasal line black, excurved below costa and ending at submedian fold; antemedial line black, oblique towards costa, then erect and very slightly angled inwards at submedian fold; a double sinuous blackish medial line, oblique to discal fold, then erect; a curved black discoidal striga; postmedial line black, strongly bent outwards below costa, then excurved to vein 3 with a slight inward curve at discal fold, at vein 3 retracted with a downward curve to lower angle of cell, then erect and sinuous, some slight blackish marks beyond it on costa; subterminal line blackish, slightly waved and interrupted, somewhat angled outwards below veins 7 and 4, then incurved; a waved blackish terminal line. Hind wing pure white. Underside white, the costa of both wings slightly irrorated with brown; fore wing with some black points on terminal part of costa, a minutely waved black terminal line, the cilia brown at tips; hind wing with minutely waved black terminal line from apex to vein 2.

Ab. 1. Fore wing with the postmedial line not retracted to lower angle of cell, but curved downwards between veins 3 and 2, then erect.

1908: Sept. 3,—1 ♀; Sept. 17,—1 ♀: Sept. 18,—1 ♀ ab. 1 (B.M.); Sept. 19,—1 ♀; Sept. 23,—1 ♂; Sept. 24,—1 ♀; Oct. 2, —1 ♀; Oct. 3,—1 ♂ (type); Oct. 24,—2 ♂ (1 in B.M.). **1909**: Mar. 10,—1 ♀ (B.M.); Mar. 17,—1 ♀; Mar. 29,—1 ♀; Apr. 8, —1 ♀. *Exp.* 22 millim.

AUCHENISA CERURODES, sp. n. (Pl. I. fig. 43, ♂.)

♂. Head and thorax white mixed with some rufous and black; antennæ rufous; palpi black towards base; tarsi black; abdomen white, dorsally mixed with rufous and black. Fore wing white slightly irrorated with fuscous brown; black streaks on vein 1 and inner margin to near middle; an antemedial black patch on costa with slight sinuous line from its outer edge to submedian fold; an oblique blackish shade just beyond the cell between veins 6 and 2; a blackish discoidal spot defined at sides by white; postmedial line double, the outer line black, the inner line black at costa, then slight brown and minutely waved, curved, from costa to vein 2, an oblique wedge-shaped black-brown patch beyond it on costal area; traces of an oblique slightly waved brownish subterminal line; a terminal series of black striæ. Hind wing semihyaline white, a black discoidal lunule and terminal series of small black spots, minute towards apex. Underside white; both wings with black discoidal spots and terminal series of striæ; fore wing with the costa suffused with brown expanding towards apex and with white postmedial mark on it.

1909: Oct. 22,—3 ♂ (including type). *Exp.* 32 millim.

CATEPHIA PYRAMIDALIS, sp. n. (Pl. I. fig. 45, ♂.)

♂ ♀. Head and thorax brown mixed with grey-white; palpi white in front; pectus white; tarsi black ringed with white; abdomen whitish, dorsally suffused with brown, the crests blackish. Fore wing grey suffused and irrorated with dark brown; subbasal line black, sinuous, from costa to vein 1; antemedial line black, waved; claviform defined by black; orbicular defined by black and with blackish point in centre, round; reniform with blackish centre defined on inner side by white and black lines and on outer side by white, narrow and somewhat produced at lower extremity; medial line blackish, oblique to the reniform, oblique and sinuous below the cell; a triangular whitish shade from postmedial part of costa to beyond the reniform; postmedial line black, strongly bent outwards below costa, then excurved with a curve inwards at discal fold, oblique and sinuous below vein 4, a sinuous dark line beyond it, and some white points on costa; subterminal line dark brown, waved, angled outwards at vein 7 and excurved at middle, then incurved; the veins of terminal area with slight dark streaks; a terminal series of small black lunules. . Hind wing white, the veins and inner area tinged with brown, the terminal area broadly fuscous brown; cilia white, tinged with brown at apex, middle, and tornus. Underside white, the costal areas irrorated with brown, the terminal area suffused with brown; both wings with blackish discoidal lunules and postmedial line, excurved below costa of fore wing.

Ab. 1. Fore wing with the postmedial triangular patch whiter and more distinct.

Ab. 2. Fore wing with black-brown fascia above vein 1 between the ante- and postmedial lines.

1908: Sept. 21,—1 ♀; Oct. 30,—1 ♀. **1909**: Mar. 9,—1 ♀ ab. 2 (B.M.); Mar. 13,—1 ♀; Mar. 26,—1 ♂; Mar. 30,—1 ♀; Apr. 6, —1 ♀; Apr. 8,—1 ♂, 1 ♀ (♂ is ab. 2, in B.M.); Apr. 10,—1 ♀; Apr. 11,—2 ♀; Apr. 15,—1 ♀; Apr. 18,—1 ♀; Oct. 14,—1 ♂, 1 ♀ (♂, type, B.M.); Oct. 22,—1 ♀; Nov. 6,—1 ♀ (B.M.); Nov. 7,—1 ♀, ab. 1 (B.M.). **1910**: Mar. 6,—1 ♀; Mar. 16, —2 ♀ (1 ab. 1 in B.M.). *Exp.* 24–30 millim.

CATEPHIA POLIOCHROA, sp. n. (Pl. I. fig. 47, ♀.)

♀. Head, thorax, and abdomen white mixed with brown; frons with lateral black bars; pectus white; legs white tinged with rufous. Fore wing whitish suffused with brownish grey; subbasal line black, from costa to submedian fold; antemedial line black, oblique and sinuous to submedian fold, then angled inwards at vein 1, a slight oblique black streak before it above inner margin; claviform red-brown defined by black and with black streak from it to the postmedial line, oblique, with its upper edge extending to median nervure; orbicular and reniform defined by blackish except above, rather elliptical, the latter with some fuscous in its lower part; an oblique blackish shade from costa to the reniform, and waved line from submedian fold to inner margin; postmedial line black, strongly bent outwards below costa, incurved at discal fold, angled outwards at veins 4, 3, then incurved and sinuous; a faint waved whitish subterminal line with slight blackish streaks before it in the interspaces; a fine waved black terminal line; cilia brown with a whitish line at base. Hind wing white, the terminal area fuscous brown, the inner area tinged with brown; cilia white, the tips brownish at middle. Underside white, the costal and terminal areas irrorated with brown; both wings with brown discoidal spot and subterminal shade.

1909: May 12,—1 ♀ (type). *Exp.* 40 millim.

CATEPHIA PERICYMA, sp. n. (Pl. I. fig. 46, ♂.)

♂. Head and thorax pale grey mixed with brown, the tegulæ with elliptical black-defined annuli; frons with lateral black bars; tarsi black ringed with white; abdomen brown mixed with whitish, the ventral surface whitish. Fore wing pale grey thickly irrorated with brown and black, the veins beyond the cell with slight dark streaks; a black-brown fascia below base of submedian fold; antemedial line black, excurved below the costa and cell, incurved in the cell and below submedian fold, an oblique black-brown shade before it on inner area, and a shade beyond it in submedian interspace to the postmedial line, filling in the claviform, which is large, defined by black, extending to the cell and acute at extremity; orbicular and reniform large, defined by black, the former round, the latter elliptical; a slight oblique brown shade from middle of costa extending into the reniform; postmedial line black, strongly bent outwards below costa, then oblique to vein 6, oblique from vein 5 to below 4, then strongly incurved, dark brown streaks beyond it on veins 3 and 2, and a black streak just below vein 2 with a slight white mark below it beyond the postmedial line; a waved black terminal line. Hind wing white, the inner area tinged with red-brown, the terminal area dark cupreous brown, broad at costa, narrowing to tornus, its inner edge sinuous; cilia white, with brown line through them between veins 4 and 2. Underside white; fore wing with the costa slightly tinged with purple, a brown discoidal spot, a subterminal brown shade except towards costa and inner margin, the area beyond it irrorated with purplish; hind wing with the costa slightly irrorated with purplish, a brown subterminal shade except towards tornus with some brown and purplish irroration beyond it.

♀. Abdomen whiter; fore wing with the brown shade on basal and median areas more diffused to inner margin, and with slight brown shade before the postmedial line except towards costa.

1909 : Mar. 14,—1 ♂, 1 ♀ (types). *Exp.* ♂ 34, ♀ 40 millim.

CATEPHIA MESONEPHELE, sp. n. (Pl. I. fig. 48, ♂.)

♂. Head and thorax whitish mixed with dark brown, the tegulæ except at tips tinged with rufous; frons with black lateral bars; palpi with some dark brown at sides of 2nd and 3rd joints; pectus white; legs tinged with rufous, the tarsi dark brown ringed with white; abdomen white, dorsally suffused with brown, the crests dark brown. Fore wing grey-white tinged with brown, the basal area suffused in parts with dark brown; subbasal line black, sinuous, from costa to submedian fold; antemedial line black defined on inner side by white, excurved below costa and at middle and more strongly to inner margin, where there is an oblique black bar before it; the medial area with oblique bright red-brown fascia from median nervure through the claviform to the postmedial line at inner margin; claviform defined by black, extending to median nervure, oblique and acute at extremity; orbicular and reniform with white annuli rather incompletely defined by brown, the former with brownish centre, round, the latter with its centre faintly defined by brown and with small brown spot in lower part, large, elliptical; postmedial line black, slightly bent outwards below costa then slightly sinuous, rather oblique to vein 4 then incurved, a faint brown line beyond it to vein 4; an oblique red-brown shade from apex and faint postmedial line, angled outwards at vein 3; a waved black terminal line forming points at the interspaces; a fine white line at base of cilia. Hind wing pure white, the terminal area fuscous brown from apex to vein 2. Underside of fore wing white, the terminal area broadly suffused with fuscous.

1908: Oct. 3,—1 ♂ (type). *Exp.* 24 millim.

CATEPHIA EURYMELAS, sp. n. (Pl. 1. fig. 49, ♂.)

♂ ♀. Head and thorax grey-white mixed with brown, the tegulæ with black lines; frons with lateral black bars; palpi white with some black at sides of 2nd and 3rd joints; pectus white; legs white tinged with rufous, the tarsi rufous ringed with white; abdomen rufous, the crests blackish, the ventral surface white. Fore wing grey suffused in parts with reddish brown, an oblique whitish shade from costa towards apex to end of cell; a subbasal black striga from costa and oblique streak above vein 1; antemedial line double, the outer line black, the inner indistinct, waved, angled inwards above inner margin; claviform slightly defined by black, narrow; orbicular and reniform defined by black, the former round, the latter incompletely defined on outer side and with blackish mark in lower part; postmedial line blackish, bent outwards below costa, then sinuous, oblique to vein 3, then incurved, some white points beyond it on costa; subterminal line reddish brown, diffused on inner side, oblique, excurved below vein 7 and at middle; a terminal series of black points. Hind wing white, the terminal area broadly black-brown from apex to submedian fold, then narrowly black-brown, the inner margin tinged with brown; cilia white with some black-brown at veins 2 and 1. Underside white, the terminal areas of both wings broadly blackish to submedian fold leaving some whitish on costa and termen of fore wing and at apex of hind wing.

Ab. 1. Patagia and basal half of fore wing strongly suffused with black-brown, the latter with the terminal half whiter slightly tinged with brown and with blackish marks at apex, at discal fold beyond the postmedial line and at termen and between terminal parts of veins 3 and 2.

1908: Sept. 25,—1 ♀. **1909**: Mar. 14,—2 ♀; Mar. 15,—1 ♀; Mar. 20,—1 ♀; Apr. 8—1 ♂ (type), 1 ♀ (B.M.); Nov. 6,—1 ♀, ab. 1 (B.M.). *Exp.* 22–26 millim.

LYNCESTIS DIASCOTA, sp. n. (Pl. I. fig. 50, ♂.)

♂. Head, thorax, and abdomen white mixed with some grey; the tegulæ with black band near tips, the abdomen dorsally suffused with fuscous from near base to beyond middle; tarsi black ringed with white. Fore wing white slightly tinged with grey, a broad oblique fuscous grey shade from costa towards apex to inner margin beyond middle, a slight black streak below basal half of costa, and the veins of terminal area streaked with black; the basal area with grey shades along median nervure and vein 1; a slight oblique dark antemedial line from cell to inner margin; a slight black streak in end of cell; cilia tinged with brown. Hind wing white, the veins towards termen streaked with black, the apex tinged with brown; a blackish terminal line. Underside of fore wing suffused with reddish brown; hind wing with the costal area irrorated with reddish brown, a subterminal shade from costa to vein 2.

♀. Greyer; hind wing with the terminal area broadly suffused with black.

1908: Sept. 16,—1 ♂ (type); Sept. 26,—1 ♂. **1909**: Mar. 19, —1 ♂; Sept. 20,—1 ♀ (type). *Exp.* 28 millim.

LYNCESTIS AMPHIX Cram.

Year ?: Mar. 20,—1 ♂.

SPHINGOMORPHA CHLOREA Cram.

Mandera.—1908: Nov. 17,—1 ♂. **1909**: Mar. 28,—1 ♀; Apr. 5,—1 ♂; June 6,—1 ♂, 2 ♀. **1910**: Feb. 9,—1 ♀.

Gan Libbah.—1908: June 24,—1 ♂; June 26,—1 ♀.

Hargaisa.—1909: Nov.,—1 ♂.

PASIPEDA SAMBESITA Wlk.

1909: Apr. 24,—1 ♂; May 21,—1 ♀; July 6,—1 ♂.

OGLASA CORNUTA Hmpsn.

1908: Nov. 17,—1 ♀. **1909**: Mar. 14,—1 ♀; Mar. 28,—1 ♂.

ASPLENIA RUBRESCENS, sp. n. (Pl. II. fig. 1, ♂.)

♂ ♀. Head and thorax red-brown mixed with some whitish and a few dark brown scales; pectus and legs whitish, the fore tarsi ringed with fuscous; abdomen red-brown, the ventral surface whitish. Fore wing bright rufous with slight dark irroration, a whitish shade tinged with rufous just beyond the cell; slight subbasal blackish points on costa and in the cell; antemedial line black, waved, double at costa; a small black annulus filled in with white in the cell towards extremity, and a slight discoidal lunule defined by blackish; a diffused blackish medial line, excurved beyond the cell, then incurved and slightly waved; postmedial line indistinctly double, red-brown and blackish filled in with whitish, slightly bent outwards below costa, then slightly waved and produced to black and white points on the veins, excurved to vein 4, then incurved, some pale points beyond it on costa; subterminal line whitish defined on inner side by dentate black marks in the interspaces, excurved below vein 7 and at middle; a terminal series of black striæ; cilia with some white at tips. Hind wing pale red-brown with a dark subterminal shade; some dark suffusion on termen towards apex and a dark terminal line; cilia white at tips; the underside white tinged with rufous, a dark discoidal point, curved red-brown postmedial line with dark points on the veins and slight subterminal shade.

1909: Mar. 26,—1 ♂; Apr. 7,—1 ♀; Apr. 8,—1 ♂; Apr. 9,—1 ♂; Apr. 10,—1 ♀; Apr. 11,—1 ♀ (B.M.); Apr. 15,—1 ♂; Apr. 20,—1 ♀; Apr. 22,—1 ♂; Apr. 23,—1 ♀; May 7,—1 ♂ (B.M.), 1 ♀; May 10,—1 ♂, 1 ♀; May 12,—1 ♂ (type); May 21,—1 ♀. *Exp.* 24–28 millim.

TEPHRIAS TRIGONOSEMA, sp. n. (Pl. II. fig. 2, ♀.)

♀. Head and tegulæ yellow tinged with rufous, the tegulæ with a rufous band behind them; thorax creamy white; antennæ red-brown; legs slightly tinged with brown; abdomen whitish, dorsally tinged with brown. Fore wing creamy white slightly irrorated with red-brown, the costa red-brown to beyond middle; a conical antemedial chocolate-brown patch from just above median nervure, its base extending to the scale-tooth on inner margin and outwardly resting on vein 1; faint oblique rufous antemedial and medial striæ from costa; postmedial line chocolate-brown, arising below costa, straight to vein 4, then retracted upwards to upper angle of cell, then running downwards with a slight inwards curve to submedian fold just beyond the antemedial patch, and with a triangular chocolate-brown patch below it between vein 4 and submedian fold; the area beyond the postmedial line and below the outer part of the antemedial patch suffused with red-brown shading to ochreous at termen; subterminal line indistinct, dark brown, oblique, dentate, angled outwards below veins 7 and 4. Hind wing creamy white suffused with red-brown especially towards termen; the underside creamy white irrorated with red-brown, the apical part of terminal area suffused with brown, a slight discoidal spot and faint curved postmedial line.

1908: Apr. 27,—1 ♀ (type). *Exp.* 22 millim.

PLECOPTERA POLYMORPHA, sp. n. (Pl. II. fig. 3, ♂.)

♂. Head and thorax brownish white slightly irrorated with fuscous; antennæ brownish; pectus and abdomen white. Fore wing white, tinged in parts with pale red-brown and irrorated with black scales; a slight red-brown subbasal line from costa to submedian fold; antemedial line red-brown, sinuous; two small almost conjoined black discoidal spots; postmedial line red-brown with some diffused blackish at costa, straight and almost erect to vein 4, then slightly incurved, a series of black points beyond it from costa to vein 4; traces of a whitish subterminal line, excurved below vein 7 and at middle; the termen and cilia suffused with red-brown; a fine waved red-brown terminal line with minute dark points at the interspaces. Hind wing white tinged with red-brown and irrorated with black, the termen and cilia more strongly tinged with red-brown; a red-brown postmedial line, excurved beyond lower angle of cell; a waved red-brown terminal line. Underside white faintly tinged with brown and irrorated with a few black scales; hind wing with black bar on upper discocellular.

♀. Varying from whitish tinged with rufous to purplish grey suffused with reddish brown, the lines of both wings and discoidal spots of fore wing often indistinct.

Ab. 1. Both wings with strong red-brown shade before the postmedial line which is defined on outer side by white.

1908: Sept. 12,—2 ♀ (1 ab. 1 in B.M.); Sept. 22,—1 ♀; Sept. 24,—1 ♂ (type). **1909**: Mar. 14,—1 ♀; Apr. 18,—1 ♀; Apr. 24,—1 ♀ (B.M.); Apr. 26,—1 ♀ (B.M.); Apr. 27,—1 ♀; Sept.,—2 ♂; Oct. 4,—1 ♀; Nov. 12,—1 ♀ (type).

Also in B.M. from Abyssinia, Tamasso (*Degen*), 1 ♀. *Exp.* 30–32 millim.

PLECOPTERA HYPOXANTHA Hmpsn.

1909: July 6,—2 ♀.

ACANTHOLIPES CIRCUMDATA Wlk.

1909: Oct. 8,—1 ♀.

ACANTHOLIPES TRIMENI Feld.

1909: May 12,—1 ♀.

ANTARCHÆA SUBFLAVALIS Wlk.

1908: Oct. 25,—1 ♂.

ANTARCHÆA FRAGILIS Butl.

1908: Sept. 14,—1 ♀; Nov. 13,—1 ♀. **1909**: Oct. 14,—1 ♀.

TATHORHYNCHUS EXSICCATA Led.

1909: May 10,—1 ♂.

ANOMIS FIMBRIAGO Steph., or EROSA Hübn.

1909: Apr. 6,—1 ♀. The females of *fimbriago* and *erosa* cannot be distinguished with certainty.

CALPE VAGABUNDA Swinh.

Mandera.—**1908**: May 29,—1 ♀; Sept. 16,—1 ♀. **1909**: Mar. 12,—1 ♂; Apr. 15,—1 ♀; Sept. 9,—1 ♀.
Hargaisa.—**1908**: Oct.,—1 ♂ (B.M.).

ARCADESA MATERNA L.

1909: Apr. 6,—1 ♂, 1 ♀; May 21,—1 ♂.

OPHIDERES FULLONICA L.

Hargaisa.—**1909**: July,—1 ♂, 1 ♀.
This species and the last were often seen at light, but were not sufficiently attracted to be easily captured.

Subfam. HYPENINÆ.

SARMATIA INTERITALIS Guen.

1908: Sept. 26,—1 ♂. **1909**: Apr. 22,—1 ♀; May 10,—1 ♀.

SIMPLICIA CAPALIS Wlk.

1908: June 1,—1 ♀.

NODARIA EXTERNALIS F.

1908: June 2,—1 ♂. **1909**: Jan. 16,—1 ♂.

HYPENA STRIGATA F. (ABYSSINIALIS Guen.).

1909: Apr. 6,—1 ♂; May 21,—1 ♂; July 6,—1 ♂.

HYPENA JUSSALIS Wlk.

1909: May 26,—1 ♀. **1910**: Mar. 16,—1 ♀.

HYPENA MASURIALIS Guen.

1909: Apr. 6,—1 ♀; Nov. 10,—1 ♀.

RHYNCHINA ANTIQUALIS Hübn.

1909: Oct. 22,—1 ♀.

RHYNCHINA PERANGULATA, sp. n. (Pl. II. fig. 7, ♀.)

♂ ♀. Head, thorax, and abdomen grey-white mixed with reddish brown; palpi tinged with red-brown and irrorated with black; ventral surface of abdomen white irrorated with brown. Fore wing grey tinged with red-brown and irrorated with black; antemedial line white, very oblique from costa to submedian fold, where there is a small fan of raised scales below its extremity; an elliptical red-brown spot in end of cell with white streak below it on median nervure and small white patch beyond its lower extremity; postmedial line fine, blackish, defined on inner side by white and on outer side also towards costa, very oblique to discal fold where it is acutely angled, then oblique to inner margin below the antemedial line, some white points beyond it on costa and an oblique white shade from apex to its angle; a slight dentate white subterminal line with oblique chocolate-brown shade beyond it from just below apex, then a series of dentate chocolate-brown marks on its outer edge; a fine chocolate-brown terminal line and white line at base of cilia. Hind wing reddish brown; a fine dark terminal line; cilia paler; the underside whitish tinged and irrorated with brown, a brown discoidal point and curved postmedial line.

1909: Apr. 7,—1 ♀ (type).

Also in B.M. from Br. E. Africa, Taveta (*Rogers*), 2 ♂; Mosambique, 1 ♂; Transvaal, Kranspruit (*Janse*), 1 ♀. *Exp.* 20–26 millim.

RHYNCHINA REVOLUTALIS Zell.

1908: Aug. 24,—1 ♀.

RHYNCHINA ALBISCRIPTA, sp. n. (Pl. II. fig. 8, ♂.)

Antennæ of male minutely serrate, with fasciculate cilia.

♂. Head and thorax white irrorated with brown; palpi with the 2nd joint fuscous brown except below, the 3rd with fuscous band; abdomen white, dorsally tinged with brown. Fore wing white suffused with brown, the inner area to the postmedial line and the termen whiter; antemedial line dark brown defined on each side by white, oblique to submedian fold, then inwardly oblique; a minute blackish annulus in the cell towards extremity; a slight white discoidal lunule defined by dark brown; postmedial line black-brown defined on each side by white, oblique to vein 6 and below vein 4; some white points beyond it on costa; a subterminal series of minute white spots in the interspaces, defined on inner side by slight somewhat dentate black marks with dentate white marks before them towards costa; a fine blackish terminal line; cilia with white lines at base and near tips. Hind wing white tinged with reddish brown; a fine brown terminal line; cilia white at tips; the underside white, the costal area and terminal area to vein 3 irrorated with red-brown, a faint curved postmedial line.

1908: Sept. 19,—1 ♂ (type); Oct. 1,—1 ♂.

Also in B.M. from Sudan, Port Sudan (*Mrs. Waterfield*), 3 ♂. *Exp.* 20 millim.

RHYNCHINA ENDOLEUCA, sp. n. (Pl. II. fig. 6, ♂.)

Antennæ of male bipectinate with short fasciculate branches, the apical part ciliated.

♂. Head, thorax, and abdomen grey-white tinged with brown; the crest at base of abdomen fuscous. Fore wing grey-white tinged with brown; a slight white streak in basal half of submedian fold, the area below it paler and tinged with red-brown; antemedial line represented by a striga of raised blackish scales from costa, some black scales on inner area and a small spot further from the base below the cell; a point of raised black scales in the cell towards extremity and a bar from origin of vein 2 to inner margin with a slight rufous line before it; a slight brown line from above end of cell to vein 6, dentate at veins 7 and 6; some minute blackish streaks on costa towards apex and an oblique whitish shade from apex to end of cell with a rufous tinge on its outer side and short black streaks in the interspaces, ending in an oblique black bar above vein 2 just beyond the bar below the cell; a subterminal series of minute black striæ, oblique from below vein 3 to submedian fold, then erect, with a slight streak beyond it in submedian fold: a slight sinuous blackish terminal line and fine white line at base of cilia which are intersected with black at the veins. Hind wing whitish tinged with red-brown; a fine brown terminal line; cilia whiter, slightly intersected with brown at the veins; the underside white tinged with rufous and irrorated with brown except on basal and inner areas, a brown discoidal point, traces of a postmedial line from costa to discal fold and a punctiform black terminal line.

♀. Fore wing with the basal half suffused with fuscous brown to submedian fold in which the white streak is stronger and the inner area more contrasting, the white shade from apex more prominent.

Ab. 1 much darker.

1908: Sept. 20,—1 ♀ (type); Sept. 27,—1 ♂ (type).

Also in B.M. from Sudan, Port Sudan (*Mrs. Waterfield*), 1 ♂, 1 ♀; Br. E. Africa, Sabaki R. (*Gregory*), 1 ♀; Kitu (*Crawshay*), 1 ♀; Takaunga (*F. Thomas*), 1 ♀; Munisu (*Lord Delamere*), 1 ♀. *Exp.* ♂ 20, ♀ 24 millim.

MAGULABA GRISEA, sp. n. (Pl. II. fig. 4, ♂.)

♂ ♀. Head and thorax black-brown mixed with reddish brown; pectus, legs, and abdomen grey, irrorated with dark brown, the palpi and fore legs suffused with black, the tarsi ringed with whitish. Fore wing grey-white suffused with reddish brown and irrorated with blackish; a sinuous blackish antemedial line; a white point in middle of cell and slight whitish discoidal striga placed on a sinuous blackish medial shade, incurved below the cell; an indistinct blackish postmedial line, excurved below costa and at middle, incurved at discal fold and below vein 4; a brown subterminal shade with series of more or less prominent black marks on it, excurved below vein 7 and at middle; a terminal series of black points. Hind wing grey suffused with brown and irrorated with dark brown; traces of two postmedial lines with the area between them rather paler; a terminal series of fuscous striæ; the underside white irrorated with brown, a dark discoidal striga and rather diffused brown postmedial and subterminal lines.

1908: Feb. 24,—1 ♂ (B.M.); Sept. 13,—1 ♂; Sept. 22,—1 ♂; Oct. 3,—1 ♂; Oct. 29,—1 ♂; Nov. 13,—1 ♂ (type). **1909**: Apr. 20,—1 ♂; Apr. 22,—1 ♀ (B.M.).

Also in B.M. from S. Nigeria, Sapele (*Sampson*), 1 ♂. *Exp.* 22 millim.

NAARDA NIGRIPALPIS, sp. n. (Pl. II. fig. 5, ♂.)

♂. Head and thorax brown mixed with grey; antennæ blackish slightly ringed with grey; palpi blackish; fore legs black, the tarsi slightly ringed with white; abdomen grey suffused with brown. Fore wing grey thickly irrorated with brown; antemedial line dark brown and sinuous: a minute ochreous spot in middle of cell and ochreous discoidal bar defined at sides by dark brown; a rather diffused erect brown medial line; postmedial line dark brown, sinuous, slightly incurved below vein 4; subterminal line whitish defined on inner side by brown, slightly sinuous; a terminal series of dark brown striæ. Hind wing grey suffused with brown; a slight brown discoidal bar and some dark scales at middle of inner margin; a curved waved brown postmedial line; a rather diffused waved subterminal line; a terminal series of dark brown striæ; the underside whitish irrorated with brown, the discoidal bar and postmedial and subterminal lines more distinct.

1908: Oct. 25,—1 ♂ (type). *Exp.* 18 millim.

Fam. LYMANTRIDÆ.

EUPROCTIS FASCIATA Wlk.

1909: Mar. 14,—1 ♂. **1910**: Mar. 10,—1 ♂.

LÆLIA TESTACEA Wlk.

Mandera.—1909: Oct. 6,—1 ♀.
Hargaisa.—1908: Oct.—2 ♂.

CASAMA VILIS Wlk.

1908: May 2,—1 ♂, 1 ♀; May 4,—1 ♂, 1 ♀; Aug. 15,—1 ♂, 1 ♀; Aug. 24,—1 ♂; Aug. 25,—1 ♀; Aug. 26,—1 ♂, 1 ♀; Sept. 3, 1 ♂: Sept. 15,—1 ♂; Sept. 18.—2 ♀; Sept. 19,—1 ♀; Sept. 21,—1 ♂, 1 ♀; Sept. 22,—1 ♂, 1 ♀; Oct. 3,—1 ♀; Oct. 14,—1 ♂; Oct. 15,—1 ♀. **1909**: Jan. 13,—1 ♀; Jan. 18,—1 ♀; Feb. 17,—1 ♂; Feb. 25,—1 ♀; Mar. 12,—1 ♂; Mar. 13,—1 ♀; Mar. 19,—1 ♀; Mar. 24,—1 ♂; Apr. 6,—1 ♂; Apr. 7,—3 ♂: Apr. 8,—1 ♂; Apr. 11,—1 ♀; Apr. 14,—1 ♂; Apr. 24,—1 ♂; Apr. 26,—1 ♂; Apr. 30,—1 ♂; Aug. 17,—1 ♂: Oct. 5,—1 ♂; Oct. 7,—1 ♂; Nov. 25,—1 ♀. **1910**: Jan. 8,—1 ♂.

DASYCHIRA MISERATA Holl.

1908: Aug. 26,—1 ♂.

DASYCHIRA REMOTA Druce.

Year?: Mar. 24,—1 ♀.

ACLONOPHLEBIA INCONSPICUA, sp. n. (Pl. II. fig. 9, ♂.)

♂. Head, thorax, and abdomen dark red-brown mixed with some whitish. Fore wing whitish tinged with red-brown and thickly irrorated with dark brown, the veins with dark streaks;

a dark brown subbasal patch from costa to below the cell; antemedial line blackish, excurved from below costa to submedian fold where it is slightly angled inwards; traces of a sinuous dark medial line; a curved black discoidal striga; postmedial line blackish slightly defined on outer side by white, somewhat dentate and produced to slight streaks at veins 7 to 2, bent outwards between veins 5 and 3, retracted below vein 2, and slightly angled outwards at submedian fold and vein 1; some slight whitish marks on costa towards apex; cilia brown, intersected with white at veins 7 to 2. Hind wing white, somewhat semihyaline, the veins slightly tinged with brown; the cilia with slight brown spots from apex to vein 2. Underside of fore wing with the terminal area white with a subterminal brown shade rather diffused on inner side and dentate on outer between veins 7 and 3.

Hargaisa.—1908: Oct.,—2 ♂ (including type). *Exp.* 30 millim.

Fam. SPHINGIDÆ.

By Dr. KARL JORDAN.

HERSE CONVOLVULI L.

Sphinx convolvuli Linné, Syst. Nat. ed. 10, p. 490. n. 6 (1758).

1909: July 6,—1 ♀; Nov. 6,—1 ♂.

POLIANA MICRA R. & J. (1903).

Poliana micra Rothschild & Jordan, Nov. Zool. ix. Suppl. p. 809, no. 766, text-fig. 6 (1903: Somaliland).

These two males from Mandera are in a better state of preservation than the type, and therefore appear purer grey on the fore wing. The only difference I notice is in the ante- and postmedial double lines being less filled-in with fuscous and a little further apart below the apex of the cell than in the type specimen, the only example hitherto known to us of this species. The genitalia of one of Mr. Feather's specimens have been examined; they are identical with those of the type.

1908: Oct. 31,—1 ♂. **1909**: May 13,—1 ♂.

HIPPOTION CELERIO L.

Sphinx celerio Linné, Syst. Nat. ed. 10, p. 491. n. 10 (1758).

Mandera.—1909: Apr. 5,—1 ♂.
Berbera.—1908: Dec. 2,—1 ♀.

HIPPOTION ROSEIPENNIS SOMALICUM, subsp. n.

♂ ♀. Ab *H. ros. roseipenni* ala antica in disco lineis quinque fuscis notata distinguendum.

In true *roseipennis* Butl. (1882), which is known to us from Delagoa Bay northward to British East Africa and Unyoro, the fore wing bears two distinct lines in the outer half, the proximal line crossing the fuscous patch which is placed at the apex of the cell, and the outer line being nearly continuous with the oblique apical streak. In between these two lines there are at most faint traces of two or three other lines parallel with them. In *somalicum*, on the other hand, the three additional lines are quite distinct, the first and second additional lines being in the male nearly, and in the female fully, as well marked as the proximal line. In this character *H. r. somalicum* represents an ancestral stage.

The genitalia do not appear to differ from those of *H. r. roseipennis*.

Mandera.—1909 : Oct. 14,—1 ♀.
Hargaisa.—1909 : Nov.,—1 ♂ (type).

HIPPOTION ROSÆ Butl.

Darapsa rosæ Butl. A. M. N. H. (5) x. p. 433. n. 5 (1882).

1909 : Oct. 6,—1 ♂.

Fam. NOTODONTIDÆ.

GARGETTA XYLOCHROA Hmpsn.

Mandera.—1908 : May 29,—1 ♀ ; Nov. 22,—1 ♂. **1909**: Feb. 17,—1 ♂.
Hargaisa.—1908 : Oct.,—1 ♂.

SCRANCIA DISCOMMA, sp. n. (Pl. II. fig. 10, ♀.)

♀. Head and thorax white mixed with reddish brown and blackish, the patagia white slightly pencilled with brown; pectus and legs white with a few brown scales; abdomen white tinged with brown and with slight lateral blackish spots except towards extremity. Fore wing white irrorated with a few black scales, the inner half tinged with red-brown, the veins streaked with black except on basal and inner areas and at costa ; a small round black-brown discoidal spot surrounded by white. Hind wing white, the terminal area tinged with brown, broadly at costa, narrowing to tornus; cilia white, faintly tinged with brown. Underside of fore wing suffused with brown, the terminal area whiter; hind wing with the costal area suffused with brown.

1908: Oct. 15,—1 ♀ (type). *Exp.* 35 millim.

STENOSTAURA IMPEDITUS Wlk.

1908 : Feb. 24,—1 ♀.

Fam. GEOMETRIDÆ.

By LOUIS B. PROUT.

These form, on account of the number of new and interesting species, an extremely important part of Mr. Feather's collection. Their general affinities, as might be expected, are with the fauna of Abyssinia, British East Africa, and to some extent Socotra and Southern Arabia, and desert forms are strongly in evidence. Nearly all the species are of small size, the majority belong to a few groups (especially Acidaliids and the *Macaria* group), and one extensive subfamily (the Larentiinæ) is almost absent, being represented by only two specimens, while even of these one is the somewhat anomalous *Pseudosterrha philaria*. The presence, in the groups named, of a number of closely allied and inconspicuous species (in some cases also strongly variable) has rendered a satisfactory working-out of the material a matter of no small difficulty; and this difficulty has been increased by a curious and unexplained circumstance which deserves mention – the very marked preponderance of females, this sex alone being represented in not a few cases where there is quite a good series of examples. We are not unaccustomed to meeting with Geometrid collections in which the *males* alone of many species are present, and are able readily to attribute this to the greater activity of the sex, the fact that the collection was made chiefly at light, and so on; but it is less easy to suggest what difference in habit, or what particular method of collecting, has resulted in the capture of the *females* only of so many species. That the phenomenon is not confined to a single genus or group will be seen by referring to the details given below, under *Hierochthonia featheri*, *Acidaliastis subbrunnescens*, *Tephrina*, nearly the whole of the Acidaliinæ, etc.*

Subfam. HEMITHEINÆ.

Ten species are represented, most of them more or less highly specialised forms, and including two additions to the handful of known species in which the characteristic green colour of the subfamily has given place to some shade of brown or sand-colour.

VICTORIA SEMATOPERAS, sp. n. (Pl. II. fig. 26, ♂.)

♂ ♀, 32–33 mm. Face and upper side of palpus dark red; crown of head, base of antenna, and basal one-third or more of costa red mixed with lustrous blue-blackish scales. Abdomen dorsally slightly reddish, crests lustrous, pale on summit, then reddish, a deep black spot (dot) near base of each. Fore wing with termen almost smooth; green (in all three discoloured by relaxing); discal dot white, encircled with a black-dusted red ring; distal margin with similarly coloured dark spots, namely a small one in front of R^1, a much larger one from R^1 to beyond R^2, and a small or moderately large one at tornus. Hind wing with the excision between the radials not deep, discal dot as on fore wing or less clearly ringed, tornus with indications of dark markings. Fore wing beneath with the terminal markings weakly indicated, hind wing quite unmarked.

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* [After the above paragraph was written a number of additional specimens of Geometridæ were set and added to the collection. Mr Prout wrote (Feb. 19, 1915), concerning these additions:—"They do not upset my generalisation as to the preponderance of females; indeed, they rather strengthen it, being almost exclusively of that sex except in one species (*Heterostegane indularia*) whose males were already well in evidence." On this subject see also p. 93.—E. B. P.]

1909: Mar. 14,—1 ♀; Dec. 30,—1 ♂ (type). **1910**: Jan. 2, —1 ♀.

Unfortunately all have lost the hind legs. It is evidently a near ally of *V. triplaga* Prout, from German East Africa.

PRASINOCYMA PERPULVERATA, sp. n. (Pl. II. fig. 25, ♂.)

♂ ♀, 16–21 mm. Palpus in male rather slight for the genus, in female about 1½ times diameter of eye, with 3rd joint exposed but rather short for the genus. Antenna of male with the outer pectinations longish, the inner much shorter. Hind tibia of male not dilated, the four spurs closely approximated. Head, body, and legs concolorous with wings, the vertex appreciably paler than the face. Wings rather narrower than in typical *Prasinocyma*, hind wing not at all bent at R^3, cells relatively long (fully one-half); fore wing with SC^1 generally free, R^1 not or very shortly stalked, M^1 connate or very shortly stalked, hind wing with two stalkings. White-grey with a slight tinge of brown, coarsely irrorated with fuscous, the irroration under a lens inclining to resolve itself into minute longitudinal strigulæ; cell-spots strong, elongate. Under surface less strongly irrorated.

Apparently variable, the name-typical form, with uniform irroration, the commonest; here I refer the following:—

Mandera.—1908: June 1,—1 ♀; July 17,—1 ♀; Sept. 27, —1 ♂, 1 ♀. **1909**: May 10,—2 ♀, 1 ♂ (type).

Three females show on the fore wing an ill-defined dark basal patch, dark median band from hind margin about to cell, and dark terminal dashes between the veins: ab. **subfasciata, ab. n.**

Mandera.—1909: May 10,—1 ♀. **1910**: Mar.,—1 ♀ (type).
Hargaisa.—1908: Oct.,—1 ♀.

One male is smaller (16 mm.) and with still more markings, the median area being broadly dark-mixed in *anterior* half, a dark proximal shading (forming a large, strong spot at costa) indicating the position of the obsolete subterminal line, the hind wing somewhat shorter, with distal area somewhat darkened, the antennal pectinations apparently continuing slightly less far down the shaft: ab. **perscripta, ab. n.** (**? sp. div.**).

Mandera.—1908: July 17,—1 ♂ (type).

By the length of the cells and the female palpus, as well as by the facies (which recalls *Neromia pulvereisparsa* Hmpsn.), *perpulverata* should probably be made the type of a new genus.

CHLORISSA STIBOLEPIDA (Btlr.)*.

Comibæna stibolepida Btlr. Cist. Ent. ii. p. 394 (1879).

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* [The parentheses around the names of authors placed after scientific names in this paper are used in accordance with Article 23 of the International Rules of Nomenclature (Proc. 7th Int. Cong., Boston 1907, p. 44 (1912)).—EDITOR.]

Hemithea albistrigulata Warr. Nov. Zool. iv. p. 39 (1897).
Hemithea vermiculata Warr. ibid. p. 41 (1897) (n. syn.).

1909: Apr. 20,—1 ♀; Apr. 24,—1 ♀.

A very widely distributed African species, and perhaps not structurally differentiable from *C. faustinata* Mill. (S. Palæarctic) and *C. solidaria* Guen. (Indian).

NEROMIA MALESCRIPTA (Warr.).

Hemithea malescripta Warr. Nov. Zool. iv. p. 40 (1897).

1908: Nov. 13, —1 ♂. **1909**: Mar. 1,—1 ♂.

Both examples small, with the crests red.

Distributed in Abyssinia, British East Africa, Transvaal, and Natal. I have a note, dealing with the difficult group to which this species belongs, in the press for the 'Annals of the Transvaal Museum.'

NEROMIA MANDERENSIS, sp. n. (Pl. II. fig. 24, ♀.)

♀, 20–22 mm. Face and palpus red. Vertex and antenna whitish, the latter with minute ciliation; occiput green. Thorax and abdomen concolorous with wings. Wings above green with whitish strigulation, quite like the greenest forms of *Chlorissa stibolepida* Btlr., costal edge of fore wing ochreous, otherwise markingless; fringes green, lighter distally. Under surface paler green, costal edge of fore wing as above.

Mandera.—**1908**: Sept. 25,—1 ♀ (type): Nov. 13,—1 ♀. **1909**: May 8,—1 ♀.

Hargaisa.—**1908**: Oct.,—1 ♀ (a worn example).

Hind wing less elongate than in *Chlorissa stibolepida*, termen smoothly rounded; but best distinguished by the structure. Palpus reaching beyond frons and shortly rough-scaled, but with 3rd joint small; hind tibia with terminal spurs only. If the male antenna should prove to be pectinate, the species should be considered a *Microloxia*, aberrant in the rather short 3rd joint of the palpus.

Genus HEMIDROMODES, nov.

Palpus slender, in male rather short, in female moderate, in both sexes with 3rd joint short or shortish. Tongue absent. Antenna short and rather thick, in male with moderate, in female with short pectinations. Pectus somewhat hairy; hind tibia in male short, greatly dilated (recalling that of *Synclysmus*), all the spurs present, terminal very short, the outer almost obsolete; in female with terminal spurs well developed, median short, sometimes entirely absent. Abdomen not crested, in female robust. Frenulum in male slight, in female absent. Fore wing with SC^1 from cell, free, R^1 about connate with SC^{2-5}, R^2 rather far forward, M^1 about connate or very shortly stalked with R^3. Hind wing with termen smooth, C anastomosing to scarcely one-half cell, DC not very oblique, SC^2 well stalked, R^2 little before middle of discocellulars, M^1 well stalked.

Type of the genus: *Hemidromodes robusta* Prout (*Hierochthonia*).

A connecting link between *Hierochthonia* and *Syndromodes*; the absence of the male, and the curious fact that the female examined had no trace of median spurs (though both legs are in good condition), led me to refer the species to the former genus. From *Syndromodes* it differs in antenna, male hind leg, robust female abdomen, etc.

HEMIDROMODES ROBUSTA (Prout).

Hierochthonia robusta Prout, Nov. Zool. xx. p. 435 (1913).

6 ♂, 14–18 mm.: 6 ♀, 18–24 mm.

1908: June 1,—2 ♂; July 17,—1 ♂; July 31,—1 ♀; Aug. 24, —1 ♂. **1909**: Jan. 16,—1 ♀*; Mar. 19,—1 ♀; Mar. 24,—1 ♀; Apr. 11,—1 ♂; May 10,—1 ♂; May 21,—1 ♀; Nov. 7,—1 ♀*.

Excepting the two females marked *, all are smaller—mostly considerably smaller—than the type specimens from Port Sudan.

In this species the fringes (which in neither of the originals were quite perfect) are long, proximally green, distally ochreous whitish.

HIEROCHTHONIA FEATHERI, sp. n. (Pl. II. fig. 23, ♀.)

♀, 24–26 mm. Face green. Palpus minute, whitish. Tongue vestigial. Antennal shaft white, pectinations long. Vertex white; occiput green. Thorax above green, beneath white. Abdomen robust, dorsally green, becoming white posteriorly and ventrally. Fore wing moderately broad, SC^1 from cell, anastomosing with C, SC^2 from shortly after R^1, anastomosing with SC^1, R^1 well stalked, R^2 rather extremely placed, M^1 shortly stalked; uniform bright green, nearly as the genus *Euchloris* or slightly more bluish, distal one-third of fringe white. Hind wing moderately broad, costal margin rather long, apex rounded, C anastomosing to near end of cell, R^2 rather extremely placed, M^1 short-stalked; green, rather paler than fore wing, especially towards base and costal margin. Under surface pale green.

1908: Nov. 20,—1 ♀. **1909**: Jan. 15,—1 ♀; Jan. 16,—1 ♀; Jan. 22,—1 ♀; Apr. 10,—1 ♀; Apr. 12,—1 ♀; Apr. 15,—1 ♀; Apr. 22,—1 ♀; May 9,—1 ♀ (type); Dec. 10,—1 ♀.

Probably related to *petitaria* Chr., notwithstanding the broader wings and strongly pectinate antenna. It is unfortunate that the males in this group are still unknown.

COMOSTOLOPSIS STILLATA (Feld.).

Nemoria stillata Feld. Reise Novara. Lep. Het. t. 127. fig. 17 (1875).

Eucrostes rubristicta Warr. Nov. Zool. vi. p. 23 (1899).

Eucrostis rufostellata Mab. Ann. Soc. Ent. Fr. lxviii. p. 740 (1900).

1909: May 21,--1 ♀.

A quite typical example of this widely distributed African species, extending its known range.

EUCROSTES ASTIGMATICA, sp. n. (Pl. II. fig. 22, ♀.)

♂, 15-16 mm.; ♀, 19-20 mm. Superficially very like *pygmæa* Rbl.* (=*insularis* Prout), but larger, of a still more vivid green, and without the discal dots, the pale postmedian line not discernible, or only suggested in certain lights. "Snow-white," in my description (Gen. Ins. cxxix. p. 246) of the costal edge, was not absolutely accurate, as there is, in a good light, a very delicate tinge of pinkish or violet in the white in both species. Structurally like the African members of the genus, the male palpus being less minute than in *pygmæa*, the 3rd joint in the female rather less long and slender, and the female antenna bipectinate, the longest branches about twice as long as the diameter of the shaft.

1908: Sept. 21,-1 ♂. **1909**: Apr. 21,--1 ♂ (type); Apr. 22,--1 ♀; May 10,--2 ♀.

ACIDALIASTIS SUBBRUNNESCENS, sp. n.

♀, 14-16 mm. Much more strongly and uniformly dusted with sand-colour (sometimes more yellowish, sometimes more brownish) than *micra* Hmpsn., the dark lines only weakly (in the darkest example scarcely at all) indicated, but with very conspicuous white lines proximally to the first and distally to the second; the former of these is more oblique than in *micra*, not reaching costa, the latter forms a rather more appreciable curve than in that species; *discal dot absent.* Hind wing white, becoming more or less tinged with sand-colour towards termen, in the darkest-marked example showing a curved white postmedian line. Fore wing beneath with white outer line and white hind margin, hind wing all white.

1908: June 1,--1 ♀; June 29,-1 ♀; Sept. 14,-1 ♀ (type); Sept. 17,--1 ♀; Sept. 23,-1 ♀. **1909**: Mar. 24,-1 ♀.

Very near *bicurvifera* Prout (Ann. Transv. Mus., in the press), much smaller, costa rather straighter, apex rather less sharp, termen rather less convex in posterior half, palpus and female antennal pectinations slightly shorter, markings less reddish (more olivaceous), postmedian line almost parallel with termen (in *bicurvifera* more oblique), hind wing rather shorter, less unicolorous, face apparently less reddish.

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* Denks. Akad. Wien, Math.-nat. Kl. lxxi. 2, Sep. p. 67 (1907). As only separata in advance seem to have been issued of the paper of Rebel's containing this species, and it was not noticed in the 'Zoological Record,' I do not feel to blame for having overlooked it in the 'Genera Insectorum' and created a synonym.

Subfam. ACIDALIINÆ.

Genus TRICENTROSCELIS, nov.

Face rounded, markedly prominent, with appressed scales. Palpus short, shortly rough-scaled. Tongue present. Antenna in female minutely ciliated. Pectus and femora glabrous. Hind tibia in female with a single proximal and a pair of terminal spurs, all of moderate length. Wing-shape and facies of *Acidalia*, distal margins smooth. Fore wing with SC^2 from cell, anastomosing with SC^1 and then very strongly with SC^{3-4} (*i. e.* areole double and SC^1 and SC^5 arising before and behind the apex of the distal areole), M^1 well separate from R^3. Hind wing with C normal, SC^2 very shortly stalked or almost connate with R^1, M^1 well separate from R^3.

Type of the genus: *Tricentroscelis protrusifrons*, sp. n.

Differs from the Neotropical *Scelolophia* Hulst (=*Calyptocome* Warr. = *Crypsitila* Warr.), which also has often a 3-spurred female hind tibia, in the protuberant face and longer cells.

TRICENTROSCELIS PROTRUSIFRONS, sp. n. (Pl. II. fig. 21, ♀.)

♀, 21 mm. Face fuscous. Palpus fuscous, not quite reaching extremity of frons. Vertex and antenna similarly coloured to wings, but rather paler; antennal ciliation minute. Thorax concolorous with wings. Abdomen slightly paler, 2nd–4th segments mostly occupied dorsally by a large fuscous blotch, the later segments interruptedly marked with fuscous dorsally. Fore wing with apex and termen somewhat rounded; reddish brown (light grey-brown irrorated with rufous and blackish); antemedian line indicated by rufous and blackish scales, accentuated by black spots on costa and hind margin and dots on the veins, arising before one-third costa, bent in cell, becoming oblique inwards and sinuous; discal dot small but sharp; median shade obsolescent, placed between discal dot and postmedian line, slightly more distinct as a costal dot, outbent at radials, inbent at fold; postmedian from costa slightly beyond two-thirds, faint except at costa and veins, where it is marked by black dots, angled at SC^5, then strongly oblique outwards to R^1, then more parallel with termen, but slightly sinuate inwards at R^2 and more strongly at fold; terminal dots strong, black; fringe somewhat dusted with blackish, a slender clear line at base. Hind wing with termen almost smooth, very slightly sinuous towards anal angle; concolorous with fore wing, discal dot slightly larger, median shade much stronger, nearly straight, proximal to the discal dot, antemedian wanting, the rest as on fore wing. Under surface slightly paler, the discal and terminal dots and postmedian line reproduced, though less sharp; hind wing in addition with median shade indicated at abdominal margin.

1909: Apr. 6,—1 ♀ (type).

Superficially similar to some African *Acidalia* (*exiguaria* group) or *Ptychopoda* (*sinuilinea* Prout, etc.).

TRAMINDA RUFISTRIGATA (Hmpsn.).

Ephyra rufistrigata Hmpsn. Proc. Zool. Soc. Lond. 1896, p. 267, pl. x. fig. 3.

1908: Sept. 28,—1 ♀. **1909**: Apr. 14,—1 ♀.

Described from Aden; distributed as far as British East Africa. As the male hind tibia has all spurs present, the species must be removed to *Traminda*.

TRAMINDA NEPTUNARIA (Guen.).

Timandra neptunaria Guen. Spec. Gén. Lép. x. p. 3, t. 18. fig. 5 (1858).

Timandra viridaria Walk. List Lep. Ins. Brit. Mus. xxiii. p. 800 (1861).

Gnamptoloma neptunaria Warr. Nov. Zool. ii. p. 95 (1895).

Traminda neptunaria Swinh. Tr. Ent. Soc. Lond. 1904, p. 562.

Mandera.—1909: Apr. 5,—1 ♂; Apr. 27,—1 ♀.

Hargaisa.—1908: Oct.,—1 ♂.

Widely distributed in Africa.

CHLORERYTHRA RUBRIPLAGA Warr.

Chlorerythra rubriplaga Warr. Nov. Zool. ii. p. 91 (1895).

1908: Sept. 19,—1 ♀; Oct. 25,—1 ♀. **1909**: Feb. 15,—1 ♀; Feb. 22,—1 ♀; Mar. 14,—1 ♂; May 10,—1 ♀. **1910**: Jan.,—1 ♀.

The male and two females (22 Feb. and 10 May) belong to the plain green form with the oblique red line almost entirely obsolete; the other four females have the line distinct, the ground-colour showing the three gradations well known in this group (green, green irrorated with rufous, rufescent). Doubtfully distinct generically from *Traminda*. Widely distributed in Eastern Africa.

ACIDALIA MINOA, sp. n. (Pl. II. fig. 20, ♀.)

♀, 20 mm. Unfortunately (like so many of the species) without the male, but showing sufficient peculiarities to render it safe to describe it. Absolutely without markings, very glossy, otherwise bearing a good deal of superficial resemblance to a worn female of *Minoa murinata* Scop., though with narrower wings; similarly coloured; the fore wing beneath with a smoky suffusion, which is also slightly indicated on the upper surface at certain angles of light. Head and body slightly more ochreous than wings, the face and palpus sharing this colour, not—as in the majority of *Acidalia*—black or fuscous. Abdomen rather robust. Venation rather variable, SC^1 of fore wing arising from just before apex of areole or well stalked with the other subcostals; C of hind wing not rapidly diverging from SC, sometimes anastomosing at slightly more than a point; SC^2 in two of the examples extremely shortly stalked with R^1. Termen of hind wing not at all bent in middle.

1909 : Apr. 7,—1 ♀ (type); Apr. 9,—1 ♀: Apr. 23,—1 ♀.

I suspect this may prove to belong to the less specialized section *Pylarge* (male hind tibia with terminal spurs).

ACIDALIA MINORATA (Bsd.).

Geometra (*Idea*) *minorata* Bsd. Nouv. Ann. Mus. Hist. Nat. ii. p. 263 (1833).

?*Acidalia remotata* Guen. Spec. Gén. Lép. ix. p. 458 (1858).

Acidalia consentanea Walk. List Lep. Ins. Brit. Mus. xxii. p. 745 (1861).

?*Acidalia actuaria* Walk. ibid. p. 752 (1861).

?*Acidalia derasata* Walk. ibid. xxvi. p. 1604 (1862).

1908 : July 17,—1 ♀; Sept. 11,—2 ♀; Sept. 13,—1 ♀; Sept. 25,—1 ♀; Sept. 30,—1 ♀; Oct. 11,—1 ♀; Oct. 20,—1 ♀; Nov. 24,—1 ♀. **1909**: Jan. 12,—2 ♀; Oct. 20,—2 ♀; Oct. 29,—1 ♀; Nov. 16,—1 ♀.

All fifteen females referable, so far as present knowledge is available, to this very common, very widely distributed, and moderately variable species. On an average, the lines are less crenulate and more concise than in the most typical forms, and as there is some slight variation in the breadth of the wings, as well as in the tone of colour and strength of markings, I am not prepared to say that there may not be two or three species mixed. One or two examples, in the sparseness of their irroration, recall *lactaria* Walk. (List Lep. Ins. xxii. p. 744), which, however, is possibly also only an aberrant form of *minorata*. Distributed throughout Africa, except, perhaps, the extreme north-west; also eastward to Aden and, if *actuaria* is really the same species, to India and Ceylon.

ACIDALIA SPOLIATA Walk. (?).

Acidalia spoliata Walk. List Lep. Ins. Brit. Mus. xxii. p. 744 (1861).

1908 : Nov. 22,—1 ♀.

The single example is of the *minorata* group, larger than that species, somewhat less reddish and more marked than *internataria* Walk. (List Lep. Ins. xxii. p. 746), very likely a deeply coloured form of *spoliata* Walk. (from S. Africa), or, perhaps, a form of the widely distributed Oriental species, *nesciaria* Walk. (List Lep. Ins. xxii. p. 750).

ACIDALIA HORIOCHRŒA, sp. n.

♀, 20–23 mm. Face blackish. Palpus white beneath, dark-mixed above. Vertex white. Collar pale ochreous. Thorax, abdomen, and legs concolorous with wings, fore femur and fore tibia infuscated above. Fore wing of medium breadth, with apex moderately pointed; dirty white, irrorated (variably in strength in the different individuals) with brown-grey; lines moderately strong, though resolving themselves under the lens into condensed irroration; antemedian slender, generally indistinct anteriorly, oblique outwards from one-third costa, strongly recurved in cell, oblique inwards to about one-fourth hind margin, faintly sinuous; discal dot small but sharp; median line thicker than the others, well beyond discal dot, very strongly oblique outwards from costa, very sharply bent subcostally, thence very slightly obliquely inwards and sinuous, the sinuosities being, as usual, at the folds, but never very deep, sometimes scarcely appreciable; postmedian fine, midway between median and termen or slightly nearer to the former, parallel with termen except at costa, where it makes a bend, though less sharply than the median, sinuosities slight or very slight; subterminal indicated by absence of irroration, accompanied proximally by a band of stronger irroration, distally by a *band of browner tone*, sometimes partly obscured by the grey irroration, but always noticeable, usually clearest anteriorly, not rarely showing a bright brown, almost ferruginous spot near apex; a narrow white line separates this band from the terminal line, which is black, thickest between the veins, slightly interrupted at the veins and *extends round the apex* for some distance along the costa, as in the *submutata* group; fringe with a line of stronger irroration beyond the middle, distally hereto less strongly irrorated than proximally. Hind wing with termen not bent at R^3; first line absent; median just proximal to discal dot, obsolete anteriorly; postmedian slightly sinuous, nearly parallel with termen; distal area nearly as on fore wing, the brownish band fading out at apex instead of becoming more conspicuous, the terminal line not extended round apex; fringe as on fore wing. Under surface more weakly marked, that of fore wing somewhat suffused basally, that of hind wing whiter; first line and sometimes median shade obsolete or nearly so.

1908 : Aug. 24,—2 ♀. **1909** : Jan. 16,—1 ♀; Jan. 19,—1 ♀; Feb. 18,—1 ♀; Feb. 19,—1 ♀; Apr. 22,—1 ♀; May 10,—1 ♀; May 29,—1 ♀; Aug. 17,—1 ♀; Sept. 17,—1 ♀ (type); Dec. 30, —1 ♀. **1910** : Jan. 8,—1 ♀; Jan. 12,—1 ♀.

A very distinct though unostentatious little species, recognizable especially by the characters printed in italics.

ACIDALIA (PYLARGE) NEPHELOPERAS, sp. n.

♂, 16–23 mm.; ♀, 19–23 mm. Superficially like *Glossotrophia romanaria* Mill., and *rufomixtata* Rbr., but structurally an *Acidalia* of the section *Pylarge*. Best described by a comparison with the well-known *A. submutata* Tr., with which it entirely agrees in the markings (though these are, on an average, more sharply expressed), including the continuation of the black terminal line round the apex, and the tendency (sometimes very strong) to blue-grey clouding in the distal area. Much smaller; ground-colour varying from ochreous whitish to reddish sand-colour (much as in *pulchellata* Fab.), antennal ciliation in both sexes longer, male hind tibia with a pair of spurs, face pale in lower half, termen of fore wing slightly more curved, of hind wing not subcrenulate; terminal line accompanied proximally by a fine whitish line (as in *pulchellata*), and on the fore wing expanded into a large triangular dot anteriorly to SC^5, fringe more strongly dark-dotted than in *submutata*; under surface glossy, that of hind wing scarcely paler than that of fore wing, discal dots rarely quite obsolete, fore wing generally with noticeably darkened border distally.

1908: Feb. 13,—1 ♀; Sept. 15,—1 ♂; Sept. 22,—1 ♀; Nov. 13,—1 ♀. **1909**: Jan. 12,—1 ♀; Jan. 20,—1 ♀; Feb. 18,—1 ♂; Mar. 24,—1 ♂ (type); Apr. 14,—1 ♀.

There is also a male from Port Sudan (*Mrs. E. N. Waterfield*) in coll. Brit. Mus., and a larger one from Bhuj Kutch (*Lt.-Colonel C. G. Nurse*).

Rather variable in colour and in the strength of the markings. Related to *Acidalia* (*Pylarge*) *ocellicincta* Warr. (Nov. Zool. viii. p. 9), from British East Africa.

ACIDALIA PULCHELLATA Fab.

Phalena pulchellata Fab. Ent. Syst. iii. (2) p. 171 (1794).

Acidalia addictaria Walk. List Lep. Ins. Brit. Mus. xxii. p. 749 (1861).

Craspedia addictaria Hmpsn. Faun. Ind., Moths, iii. p. 429 (1895).

? *Craspedia rufinubes* Warr. Nov. Zool. vii. p. 91 (1900).

1908: May 4,—1 ♂. **1909**: Mar. 24,—1 ♀; Apr. 24,—1 ♀; May 6,—1 ♀. **1910**: Mar. 18,—1 ♀.

Mostly of a more ruddy form than the Indian. The British Museum collection has one quite similar from Aden.

ACIDALIA TIMIA, sp. n. (Pl. II. fig. 19, ♀.)

♀, 21–26 mm. Face blackish fuscous, very narrowly pale-edged beneath. Palpus fuscous above, pale beneath. Antenna (as in *nepheloperas*) unusually strongly ciliated for a female, the cilia fully one-half as long as diameter of shaft. Vertex, thorax, and abdomen concolorous with wings; collar ochreous. Fore femur darkened on upper side. Fore wing with apex not very sharp, termen straight anteriorly, gently curved posteriorly, not extremely oblique; palest fleshy ochreous, rather glossy (similar to *beckeraria* Led., but still paler), without dark irroration, but in places slightly clouded with less whitish fleshy-ochreous; antemedian and median lines (or narrow shades) ochreous, very feeble, sometimes almost entirely obsolete, the former sometimes marked with darker dots on SC, M, and SM^2; discal dot usually distinct, sometimes elongate, placed on the median shade; postmedian line fine and faint, but marked with fuscous dots on the veins (a larger one at costa), shaped about as in *beckeraria*; darker ochreous, fuscous-dotted spots or patches commonly follow the postmedian between the radials and at posterior margin; terminal line ochreous, very feeble, especially posteriorly; fringe concolorous, in strongly marked specimens with dark ochreous or even fuscous-mixed dots. Hind wing with termen smooth; concolorous with fore wing, discal dot and postmedian row of dots present, the latter followed by a not very strong band of ochreous shading. Under surface glossy, slightly less pale ochreous (especially the fore wing), without markings.

1903: Mar. 21,—1 ♀; Aug. 15,—1 ♀; Sept. 26,—1 ♀. **1909**: Jan. 14,—1 ♀; Jan. 20,—1 ♀; Apr. 16,—1 ♀; Apr. 20,—1 ♀; May 8,—1 ♀; Oct. 7,—1 ♀ (type). **1910**: Jan. 8,—1 ♀.

Apart from the colour, and the presence of dark cloudings distally to the postmedian line, this neat little species differs from *beckeraria* in having the termen of the fore wing, on an average, less oblique.

Acidalia pyrrhochra, sp. n. (Pl. II. fig. 18, ♀.)

♀, 23–25 mm. Structure of the preceding. Face blackish fuscous (in all three examples badly abraded below). Shape and essential markings of *timia*, of which it might possibly be an extraordinarily different colour-form, unconnected with the name-type by any transitions. Strongly rufous ochreous, as in *fulvicolor* Hmpsn. (Nat. Hist. Socotra, p. 331), or the most rufous aberration of *nepheloperas* Prout, in two of the examples finely irrorated with blackish, in the other more uniform; in place of the two ochreous patches which characterize *timia* there is a continuous black-grey clouding proximally to the dentate subterminal line (which is, in consequence, distinctly expressed), and some slighter shading distally to the same—altogether recalling certain forms of *marginepunctata* Goeze, *nepheloperas* Prout, etc., more than *timia*. Under surface rather paler than upper, the distal cloudings faintly indicated in greyish.

1908: Oct. 30,—1 ♀ (type). **1909**: Apr. 9,—1 ♀; Nov. 16, 1 ♀.

The last-mentioned (the example without blackish irroration) is further aberrant in having the distal cloudings extremely weak, the discal dot of the fore wing surrounded by an ill-defined deeper reddish spot, that of the hind wing very minute. Easily distinguished from the reddest form of *nepheloperas* by the absence of black terminal line and triangular subapical dot, etc.

Acidalia luridata (Zell.).

Idæa luridata Zell. Isis, 1847, p. 20 (*nec* Stgr.).

Acidalia cœnosaria Led. Verh. zool.-bot. Ver. Wien, v. p. 209, t. 3. fig. 3 (1855) (ab.).

Acidalia luridata Prout, Seitz Macrolep. iv. p. 64, t. 4 *e* (1913).

1908: July 31,—1 ♀; Aug. 25,—1 ♀. **1909**: Jan. 12,—1 ♀; Feb. 22,—1 ♂; May 8,—1 ♂; Sept. 18,—1 ♀; Oct. 24,—1 ♀.

Fairly typical, *i. e.* rather darker than, and not quite so reddish as, the form *cœnosaria* Led., which is the more general in S. Europe and Asia Minor. The distribution of the species extends from Greece and Northern Egypt to Zerafshan and N.W. India, and the British Museum has an example from Yemen, Arabia, but the present specimens extend its known range in Africa.

ACIDALIA SAGITTILINEA (Warr.).

Craspedia sagittilinea Warr. Nov. Zool. iv. p. 219 (1897).

1909: Feb. 15,—1 ♂; Feb. 16,—1 ♂; Feb. 17,—1 ♂.

Described from Mombasa, and I have seen a few from other localities in British East Africa. Both these Somaliland examples are rather less strongly marked (especially beneath), the median shade faint, placed midway between discal dot and post-median line.

GLOSSOTROPHIA DISPARATA SOMALIATA, subsp. n.

♀, 17–19 mm. Name-typical *disparata* Hmpsn. (Nat. Hist. Socotra, p. 332, *Craspedia*) has never been described, its recognition hitherto depending on a good, though uncoloured figure (ibid. t. 20. fig. 18), and a note by Rebel (Denks. Akad. Wien. Math.-nat. Kl. lxxi. 2, Sep. p. 69) to the effect that it belongs to the *confinaria* group of *Acidalia* (i. e. *Glossotrophia* Prout), and that the male antenna might almost be called shortly pectinate (*i. e.* subdentate with fascicles of cilia). It is the smallest of the genus; male hind tibia with one spur, hind wing slightly less regularly rounded than in the typical species (slightly bent at R^3); sand-colour with dense dark irroration, not "fluted" as in *romanaria* Mill., terminal line (except towards apex) broken into very short, strong dashes, at and round apex fine and less pronounced than in most of the species. *Face concolorous.* Palpus dark-mixed on outer side. Tongue moderately long. Subsp. *somaliata* (bon. sp.?) is rather larger, fore wing slightly longer, irroration much lighter, showing a feeble tendency towards the "fluting"; terminal dashes more slender and less black, apical line somewhat more pronounced. Palpus with less dark spotting on outer side.

1908: Sept. 14,—1 ♀. **1909**: Jan. 11,—1 ♀ (type).

ZYGOPHYXIA TORNISECTA, sp. n.

♂, 14 mm.; ♀, 16–19 mm. Face and palpus fuscous. Tongue slender, rather short. Antennal ciliation in male moderately long. Vertex white. Collar white, with a slight ochreous tinge. Thorax, abdomen, and legs concolorous with wings. Hind tibia in both sexes with terminal spurs. Wings less narrow than in *relictata* Walk. (the type of the genus); fore wing only slightly, hind wing decidedly, narrower than in *elongaria* Rbr., which in some respects it rather recalls; hind wing with shallow, rounded excision from M^2 to tornus, inner margin consequently shortened. Dirty white with a tinge of brownish, and with moderately strong fine brown-grey irroration; discal dots small, black; lines generally not sharply defined (in the male particularly weak), those of the fore wing approximately parallel with the termen, the slender antemedian and broad (sometimes strong) postmedian perhaps slightly more oblique and with a strong proximal bend at costa, the median touching the distal edge of the cell-dot, postmedian slender, proximal subterminal broad, distal subterminal very weak; first line of hind wing absent, median shade rather straight, except the sharp anterior bend; termen with black dots between the veins; fringe dusted with fuscous, most thickly opposite the veins, a fine pale line at its base, a broader one just beyond the middle. Underside similar or more blurred.

1908: Aug. 15,—1 ♀. **1909**: Feb. 28,—1 ♂ (type); Mar. 24, —1 ♀; Apr. 15,—1 ♀.

PTYCHOPODA SUBTORRIDA, sp. n. (Pl. II. fig. 17, ♀.)

♀, 18 mm. Face and palpus black. Vertex, antenna, thorax, abdomen, and fore leg concolorous with wings (other legs lost). Fore wing rather narrow; light ochreous brown, almost entirely suffused with vinous, less so basally and costally; scattered black irroration; lines black; antemedian from one-fourth costa, oblique outwards, very acutely angled in cell, then equally oblique inwards to behind M, thus forming a **V**-mark, a second, much shorter angle outwards at fold, but the entire posterior half of the line less strong, more dissolved into coarse black dots; median line from mid-costa, sinuous in **S**-shape, the anterior (outward) curve crossing the deep-black cell-spot; postmedian from costa at nearly three-fourths, forming an inward curve or bend at first, sharply angled outwards at R^1 (forming a shorter **V** than the antemedian), weakly incurved between the radials and boldly between M^1 and SM^2, finally oblique inwards at hind margin; distal area with blackish cloudings, the most conspicuous being one at R^1 (interrupted at the position of the obsolete subterminal line) and a longitudinally elongate pair on either side of M^1; no terminal line; fringe very long, its proximal half light ochreous brown, opposite the veins with amorphous spots formed of groups of black dots, distal half paler and somewhat greyer, unmarked. Hind wing rather narrow, with termen almost smooth, not very strongly convex; more strongly irrorated than fore wing, especially at base; first line not developed; median thick and somewhat diffuse, proximal to the sharp black cell-spot; postmedian as on fore wing, but with the angle at R^1 less pointed; distal area with two somewhat sinuous bands of dark irroration, enclosing a pale subterminal line; fringe as on fore wing. Under surface considerably paler, costal margin of fore wing finely dark-dusted, the rest rather smooth and glossy; both wings with strong discal spot (larger than above) and a moderately strong outer line, starting from a slightly enlarged spot at costa which corresponds to the origin of the postmedian of upper surface, but oblique outwards, bent about R^1, thence approximately parallel with termen, corresponding to the proximal subterminal dark shade of the hind wing above; fringe unspotted.

1909 : Mar. 24,—1 ♀ (type).

Near *torrida* Warr. (Nov. Zool. xi. p. 468), termen of hind wing less protuberant, antemedian line more acutely angled, not connected with median by dark shading, under surface more strongly marked.

PTYCHOPODA NIGROSTICTA Warr. (?).

Ptychopoda nigrosticta Warr. Nov. Zool. iv. p. 61 (1897).

1908 : Feb. 24,—1 ♀ (rather worn).

The large discal dots and the markings, so far as they can be made out, suggest the more mottled forms of this species, but the former are perhaps somewhat exaggerated, the wings are rather more coarsely dusted, with stronger dark markings near the termen, the underside with the cell less infuscated and with the spot near the tornus apparently wanting. Described from Natal and occurs in the Transvaal and, perhaps, British East Africa, but it is by no means certain that these more northerly specimens belong here: they may be slightly narrower winged. Good specimens, and especially the male, must be awaited.

PTYCHOPODA sp.

1908 : Aug. 26,—1 ♀. Rather rubbed.

Probably new, unless it be a form of *subpurpurata* Stgr. (from Syria, etc.). Rather uniform reddish sand-colour, very weakly marked: fore wing with traces of a strongly sinuous darker median line, hind wing with fine, strongly sinuous postmedian line; both these lines marked with some fuscous dusting.

PTYCHOPODA APERTA, sp. n. (Pl. II. fig. 16, ♂.)

♂, 17 mm. Face dark fuscous. Palpus short and slender, dark fuscous. Tongue slight. Antennal ciliation scarcely longer than diameter of shaft. Head, body, and legs about concolorous with wings; fore leg fuscous above; abdomen dorsally belted with fuscous. Fore wing with all the subcostals on a common stalk, through suppression of distal wall of areole (base of SC^{3-5}); brown with a tinge of reddish and with rather coarse blackish-fuscous irroration, mainly longitudinal in direction; base more strongly irrorated costally; first line ill-defined, bent, becoming oblique inwards, with some black marking near costa; median shade also ill-defined (especially in anterior half), strongly sinuous, the proximal curve in submedian area being rather deep; postmedian line well expressed, from a black spot at two-thirds costa to one at about three-fourths hind margin, forming a slight outward curve from SC^5 to M^2 and a stronger submedian inward curve, marked throughout with small dark dashes on the veins; some broad, vague, irregular dark shading between this and termen; fringe with large black spots opposite the veins. Hind wing with termen somewhat sinuate towards tornus; M^1 separate at its origin from R^3; concolorous with fore wing, the median and postmedian lines strongly expressed; distal area and fringe as on fore wing. Under surface paler; fore wing very weakly marked, only the postmedian line showing, and that faintly; hind wing with median and postmedian lines, though much weaker than above; fringes with the dark spots present, but weaker than above.

1909: Jan. 13,—1 ♂ (type).

In some respects similar to *Pt. semilinea* Warr. (Nov. Zool. iii. p. 314), from the Khasia Hills. Remarkable for the subcostal venation of the fore wing, which is like that of *Chrysocraspeda* and almost unique in *Ptychopoda*; I know of only one species which shares the peculiarity, namely *marginata* Swinh. (Tr. Ent. Soc. Lond. 1894, p. 182), unless *chrysocilia* Hmpsn. (Ill. Het. viii. p. 124) is also a *Ptychopoda*; in any case none of the three has any connection with *Chrysocraspeda*, which has strongly pectinate male antenna, hind tibia with four spurs, cell of hind wing short, etc.

Subfam. LARENTIINÆ.

PSEUDOSTERRHA PHILÆARIA (Brabant).

Sterrha philæaria Brabant, Bull. Soc. Ent. Fr. 1896, p. 384.

Pseudosterrha gayneri N. Rthschd. Nov. Zool. viii. p. 433 (1901); xii. t. 4. fig. 10 (1905).

1908: Sept. 16,—1 ♀.

Described from Egypt. I suspect, however, it is merely a form of—or even entirely synonymous with—*Ps. paulula* Swinh. (Proc. Zool. Soc. Lond. 1886, p. 456), from India.

EUPHYIA (CAMPTOGRAMMA) NATALATA (Walk.).

Scotosia natalata Walk. List Lep. Ins. Brit. Mus. xxv. p. 1681 (1862).

Scotosia rubritincta Hmpsn. Bull. Liverp. Mus. ii. p. 38 (1899).

Hargaisa.—**1908**: Oct.—1 ♂.

Widely distributed in East Africa, also Socotra.

Subfam. GEOMETRINÆ.

HETEROSTEGANE INDULARIA (Guen.).

Stegania indularia Guen. Spec. Gén. Lép. x. p. 46 (1858).

Mandera.—**1908**: Apr. 27,—1 ♂; May 2,—1 ♀; May 28,—1 ♀; June 1,—2 ♂, 4 ♀; June 18,—1 ♂; June 29,—2 ♂; July 8,—1 ♂; July 17,—1 ♂; July 24,—1 ♂; July 31,—1 ♂; Sept. 13,—3 ♂, 1 ♀; Sept. 14,—1 ♂; Sept. 17,—2 ♂; Sept. 22,—1 ♂; Sept. 24, 4 ♂, 1 ♀; Sept 26,—2 ♂, 1 ♀; Oct. 1,—1 ♂. **1909**: Mar. 24,—1 ♀; Apr. 8,—1 ♂; May 10,—1 ♀. **1910**: Mar. 2,—1 ♀.

Hargaisa.—**1908**: Oct.,—1 ♂.

The series from Mandera shows the usual range of variation in ground-colour and intensity of markings, but nearly all are of small size.

The male from Hargaisa may perhaps be referred to ab. *calidata* Warr. (Nov. Zool. iv. p. 78), though the ground-colour remains pale; all three lines are strongly developed; possibly a distinct species, as the palpus looks a little stronger and the antennæ (unfortunately damaged) may have less long ciliation.

Described from Abyssinia, but extends through eastern Africa to the Cape.

ZAMARADA SECUTARIA (Guen.).

Stegania secutaria Guen. Spec. Gén. Lép. x. p. 45 (1858).

Zamarada pulverosa Warr. Nov. Zool. ii. p. 158 (1895).

Mandera.—1908: Sept. 23,—1 ♂.

Hargaisa.—1908: Oct.,—1 ♂.

Both are small, the Hargaisa example rather worn, but apparently more weakly dusted than usual.

This species is likewise distributed from Abyssinia to the Cape.

OSTEODES PROCIDATA Guen., subsp. ERITREENSIS Prout.

Osteodes procidata Guen. Spec. Gén. Lép. x. p. 177 (1858).

Osteodes turbulentata Guen. ibid. (1858).

Aspilates semispurcata Walk. List Lep. Ins. Brit. Mus. xxvi. p. 1679 (1862).

Gan Libbah.—1908: June 24,—1 ♂. **1909**: Nov. 4,—1 ♀.

Both with the dark borders strong (subsp. *eritreensis* Prout, Nov. Zool. xxii. p. 348, described from Eritrea).

Distribution as in the two preceding. Warren (Nov. Zool. ix. p. 529) apparently regarded Guenée's two forms (from Abyssinia and the Cape) as separate species, but Guenée's descriptions and the material before me suggest that Swinhoe (Tr. Ent. Soc. Lond. 1904, p. 504) is correct in uniting them.

DISCALMA SUBCURVARIA (Mab.).

Tephrina subcurvaria Mab. Ann. Soc. Ent. Fr. lxvi. p. 278 (1897).

Hargaisa.—1908: Oct.,—1 ♂.

This species, apparently common throughout East Africa from Abyssinia to Natal, and originally described as from West Africa, has been mixed in our British collections with *observata* Walk. (List Lep. Ins. xxiii. p. 963) from the Cape, but I doubt the correctness of this; the latter, apart from its much darker and rather more reddish colour, has the median shade of the fore wing more oblique and the postmedian line rather further from the termen.

DISCALMA PUERILIS, sp. n. (Pl. II. fig. 15, ♂.)

♂, 16 mm. Face apparently without projecting cone of scales. Antennal joints scarcely projecting, the cilia scarcely as long as diameter of shaft. Head, body, and legs concolorous with wings; hind tibia dilated, with long hair-pencil, tarsus rather short.

Fore wing with fovea slight, SC^{1-2} coincident, touching C at a point; dirty white irrorated with brown-grey, leaving clearer a slight, ill-defined antemedian band (at least towards hind margin), a fairly broad but exceedingly ill-defined band just distally to the cell-dot and especially a broad, somewhat sinuous subterminal line, from costa at less than 1 mm. before apex to tornus, slightly dark-shaded proximally, especially at costa and hind margin; a small discal dot near costa at middle; a slightly darkened terminal line, interrupted at the veins; fringe pale (whitest proximally), traversed in middle by a fine grey line and cut throughout its length by brown-grey spots opposite the veins. Hind wing with termen almost smooth (scarcely waved); similar to fore wing, but with pale band-like markings scarcely indicated, subterminal line not quite so conspicuous as on fore wing; no discal dot; indications of a dark spot (end of a line) about middle of inner margin. Under surface similarly but more faintly marked; discal dot of fore wing absent.

1910: Feb. 14,—1 ♂ (type).

A very distinct though modest little species; it may be pictured by imagining a miniature edition of the North American "*Sciagraphia*" *nubiculata* Pack., exceedingly washed-out, dark lines of hind wing absent; structure as in that species, wings slightly narrower.

DISCALMA CALVIFRONS, sp. n. (Pl. II. fig. 14, ♂.)

♂, 17–20 mm. Face rather protuberant, rough, almost scaleless, with small horny prominences at upper and again at lower edge. Palpus rather short, rough-scaled, grey mixed with fuscous, 3rd joint very small and blunt. Antenna with joints projecting, the ciliation about as long as diameter of shaft, arranged in very slender even fascicles. Thorax and abdomen concolorous with wings, the patagia in front more fuscous. Hind tibia with hair-pencil. Fore wing with fovea; not broad, the termen being rather straight and moderately strongly oblique; SC^{1-2} coincident, sometimes free, sometimes slightly connected or anastomosing at a point with one or both of the adjacent veins; white-grey, irrorated with brownish fuscous; discal dot black, variable in size; lines fuscous, irrorated more or less with blackish, sometimes sharply dark at costa; antemedian from nearly one-fourth costa, oblique outwards, strongly angled in front of M, then oblique inwards to M, here sometimes marked with a blackish dot, then running perpendicularly to hind margin, occasionally with a very slight curve inwards; median line very variable in strength and thickness, usually crossing, sometimes just proximal to, the discal dot, almost straight except for a small proximal bend at costa; postmedian from before three-fourths costa, vertical or (oftener) slightly oblique outwards, curved or angled at R^1, thence about parallel with termen, marked with blackish vein-dots, sinuate inwards in submedian area and slightly oblique outwards at hind margin; distal area (at least in its proximal half) clouded with dark grey, with a distinct, sinuous, whitish, subterminal line, which is rather thick in places, and especially widens at costa so as almost to reach apex; proximally to the subterminal an irregular blackish spot between R^3 and M^1, sometimes also anteriorly to R^3; termen with a row of moderately thick blackish dashes; fringe weakly dark-chequered opposite the veins. Hind wing with termen almost perfectly rounded, sometimes with a slight suggestion of prominence at R^3 and sinuosity in front of the same; similar to fore wing, without the antemedian line. Fore wing beneath somewhat more suffused from base to median shade; discal dot weak; the shade between postmedian and subterminal strengthened into a dark band, without the blackish spot, the subterminal itself obsolete; band between median and postmedian lines, also the posterior half of distal area (or at least a patch behind R^3) somewhat whiter than above. Hind wing beneath whitish, with median shade, discal dot and outer band distinct. Female, on an average, rather larger, rather broader-winged, sometimes more suffused, lines generally weak (except the costal spots), distal dark shade extended to termen, usually almost obliterating the subterminal line except costally, where the subapical pale spot persists, at least in part, black spot proximally to subterminal line between R^3 and M^1 seldom developed; the hind wing and under surface show corresponding differences.

1908: Sept. 14,—1 ♂; Sept. 24,—1 ♂; Sept. 28,—1 ♂; Oct. 14, —1 ♀; Oct. 15,—1 ♂; Oct. 24,—1 ♂ (type). **1909**: Apr. 10,— 2 ♀; Apr. 14,—1 ♂; Apr. 22,—1 ♀; Apr. 27,—1 ♀; May 10,— 1 ♀; May 12,—1 ♀.

Variable both individually and (in particular) sexually. More recalls certain tropical American species (e. g. *Macaria nigricomma* Warr. in the case of the male, *heliothidata* Guen. in that of the female) than any African species with which I can compare it. Scarcely a true *Discalma*.

MACARIA SEMIALBIDA Prout.

Macaria semialbida Prout, Nov. Zool. xxii. p. 351 (1915).

1908: June 21,—1 ♂.

Antenna broken, but a remnant shows that the ciliation is scarcely as long as the diameter of the shaft. Hind tibia strongly dilated. Fovea strong.

Founded on females from British East Africa.

MACARIA OBLIQUILINEATA (Warr.).

Gonodela obliquilineata Warr. Nov. Zool. vi. p. 307 (1899).

Semiothisa obliquilineata Swinh. Tr. Ent. Soc. Lond. 1904, p. 507.

1908: May 4,—2 ♀. **1909**: Mar. 14,—1 ♂; Apr. 11,—1 ♀; May 10,—1 ♀; Nov. 10,—1 ♀.

Rather variable, on an average slightly smaller than the examples (Abyssinia, White Nile, British East Africa) in the British Museum, postmedian line of fore wing rather more curved at costa. In the fore wing veins SC^{1-2} are coincident, in three examples free, in three slightly connected with C.

TEPHRINA INCONSPICUA Warr.

Tephrina inconspicua Warr. Nov. Zool. iv. p. 113 (1897).

1908: July 2,—1 ♀; Aug. 21,—1 ♀.

Rather weakly marked, especially the hind wing, which appears rather more whitish than in the normal form (Natal to Nyassaland); but it is not in quite perfect condition. In the fore wing the costal end of vein C is obsolete, leaving it to appear that C and SC^1 are coincident throughout, anastomosing shortly with SC^2. A worn female from Arabia (coll. Brit. Mus.) appears to agree with the Somaliland example, though larger and with normal venation; thus the species seems to be widely distributed.

TEPHRINA BUTARIA (Swinh.).

Semiothisa butaria Swinh. Tr. Ent. Soc. Lond. 1904, p. 510.

1909: May 8,—1 ♂.

Known from Central and East Africa and as far north as Abyssinia.

TEPHRINA NETTA (Holland).

Grammodes netta Holland, in Donaldson-Smith, Through Unknown African Countries, p. 418, fig. 9 (1897).

1908: July 1,—1 ♂; July 31,—1 ♀; Sept. 21,—1 ♀; Sept. 26,—1 ♀. **1909**: May 21,—1 ♀; July 8,—1 ♀; Aug. 17,—1 ♂.

As I understand Sir George Hampson has compared Holland's type, I accept the determination of the species at the British Museum, which possesses a single example from Abyssinia. The fore wing agrees well with Holland's figure, but the hind wing has distal borders nearly as in *Discalma subcurvaria* Mab., or even more extended to the termen. Male antenna bipectinate.

TEPHRINA CINERASCENS (Btlr.).

Acidalia cinerascens Btlr. Ann. Mag. Nat. Hist. (4) xvi. p. 418 (1875).

Ematurga bilineata Warr. Nov. Zool. ii. p. 129 (1895).

Tephrina cinerascens Swinh. Tr. Ent. Soc. Lond. 1904, p. 511.

1909: May 10,—1 ♀. Rather worn, weakly marked.

Distributed from the Cape to British East Africa, and doubtfully distinct from *pumicaria* Led. (Syria) and *fumosa* Hmpsn. (India). The large, strongly marked Abyssinian form figured by Guenée (Phal. t. 17. fig. 7) is unknown to me.

TEPHRINA DISPUTARIA (Guen.).

Eubolia disputaria Guen. Spec. Gén. Lép. x. p. 489 (1858).

Tephrina disputaria Hmpsn. Faun. Ind., Moths, iii. p. 209 (1895).

Mandera.—**1908**: June 1,—1 ♀; June 29,—1 ♀; July 5,—1 ♀; July 17,—1 ♀; Aug. 24,—3 ♀; Sept. 13,—1 ♀; Sept. 19,—1 ♀; Sept. 26,—1 ♂, 1 ♀; Oct. 12,—1 ♀. **1909**: Jan. 18,—1 ♀; Jan. 19,—1 ♀; Mar. 12,—1 ♀; Mar. 19,—1 ♀; Apr. 7,—1 ♀; Apr. 22,—1 ♀; Aug. 17,—1 ♂, 2 ♀; Oct. 5,—1 ♀; Nov. 9,—2 ♀. **1910**: Mar. 2,—1 ♀; Mar. 6,—1 ♀. Year ?: Feb. 25,—1 ♀.

Hargaisa.—**1908**: Oct.,—4 ♂.

Extremely variable, occurring probably throughout the year, though none was taken in February or December. The great majority of the females belong to the form *subocellata* Warr. (Nov. Zool. iii. p. 413), described from S. Othman, Arabia. I follow Swinhoe in considering *subocellata* to be a form of the variable *disputaria* Guen. Two of the males are small, with the distal part of the median area almost free from dark dusting, the postmedian line more than usually bent. A few females are also small, but otherwise normal. Two females are smooth-scaled, the distal area broad, inclining to violet-grey, the black marks on hind margin of fore wing and those distally to the middle of the postmedian line very sharply prominent.

Described from Egypt, but widely distributed in North and East Africa, Arabia, India, etc.

TEPHRINA DEERRARIA Walk.

Tephrina deerraria Walk. List Lep. Ins. Brit. Mus. xxiii. p. 962 (1861); Swinh. Tr. Ent. Soc. Lond. 1904, p. 510.

Mandera.—**1908**: Oct. 15,—1 ♀. **1909**: Apr. 7,—1 ♀; Apr. 10,—1 ♀; Apr. 22,—1 ♀; May 10,—1 ♀; Oct. 7,—1 ♂; Oct. 11,—1 ♂. **1910**: Jan. 8,—1 ♀.

Buggan.—**1908**: June 27,—1 ♂.

In one female the discal spot of the fore wing is reduced, scarcely forming an ocellus. Generally larger than the preceding, less brown, postmedian line straighter, otherwise hard to distinguish; perhaps a form of the same. Distributed from the Cape to Abyssinia.

TEPHRINA PRIONOGYNA, sp. n. (Pl. II. fig. 13, ♀.)

♀, 28–33 mm. Antenna strongly serrate, the serrations of the outer series so long as to form rudimentary pectinations. Fore wing with SC^1 out of C, free or anastomosing at a point with SC^2, SC^2 in one example anastomosing at a point with SC^{3-4}. Otherwise extremely like strongly irrorated females of the preceding *; discal mark of fore wing reduced to a small weak dot, median shade usually absent, antemedian line of fore wing more strongly curved, postmedian curving anteriorly (both variable in distinctness), terminal dots weaker or obsolete, the dark distal border beneath extended to the termen, or else becoming uniformly lighter there, no tendency towards the *central* pale terminal patches which are general in *deerraria*, termen of hind wing smooth (in *disputaria* often slightly more undulate).

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* In *disputaria* and *deerraria* SC^{1-2} are coincident, often anastomosing at a point or slightly connected with SC^{3-4}. Even if this difference prove not absolutely constant, it is at least general.

1909. Apr. 15,—1 ♀; May 9,—1 ♀; May 10,—3 ♀ (including type).

CHENINA TERGIMACULA, sp. n. (Pl. II. fig. 12, ♂.)

♂ ♀, 24 mm. Face ochreous, lower half with a large fuscous spot on each side. Palpus with 3rd joint short, ochreous mixed with fuscous. Male antennal pectinations long and reaching to near apex—beyond three-fourths (female without head). Vertex, thorax, and abdomen concolorous with wings, abdomen with a dark fuscous dorsal blotch anteriorly. Fore wing narrow, costa and termen almost straight, hind margin somewhat convex, in female sinuous; SC^2 connected by bar with SC^{3-4}, R^3–M^1 stalked (sometimes rather long-stalked); pale ochreous whitish, irrorated and suffused, especially at base and half-way along costa, with purple-grey; a brown or fuscous stripe from beyond middle of costa, oblique outwards, strongly curved or angled between R^1 and R^2, oblique inwards (and forming a very slight proximal curve) to middle of hind margin; a faint, oblique antemedian line or shade usually indicated, another midway between postmedian and termen, bearing in its anterior part two or three darker wedge-shaped spots, the one before R^1 the strongest and blackest; fringe spotted with fuscous. Hind wing narrow, especially in female, tooth at end of SC^2 in female very acute and produced, termen in male weakly, in female more strongly, toothed at R^3, anal angle scarcely produced; concolorous with fore wing or rather more brightly and sharply marked; a broad, dark, olive-brown, fuscous-mixed, somewhat sinuous band from inner margin near anal angle to costa near apex, finely white-edged distally, the white broadening anteriorly. Under surface similar, the markings weaker and more diffuse.

1908: Oct. 3,—1 ♂. **1909**: Apr. 7, -1 ♂; Apr. 12,—1 ♂ (type); Sept.,—1 ♀.

Genus SESQUIALTERA, nov.

Face slightly prominent, convex, with moderately appressed scales. Palpus moderate, rather stout, rough-scaled, terminal joint short. Tongue short. Antenna in male (?); in female slightly subserrate, with very minute ciliation. Pectus and femora moderately hairy. Hind tibia with terminal spurs only. Fore wing long and narrow (greatest breadth—mid-costa to tornus—three-eighths of length), costa nearly straight, apex rather sharp, termen, except close to apex, extremely oblique, slightly curved, very faintly sinuous, rather longer than hind margin; tornus very weak; cell short, less so at its extremities, DC^2 being oblique inwards and DC^3 extremely oblique outwards; SC^{1-2} long-stalked, SC^1 sometimes anastomosing with C^1, SC^2 connected by a bar with SC^{3-4} about opposite the origin of SC^5, SC^{1-5} long-stalked from just before end of cell, SC^{1-4} separating near apex; radials normal; M^1 long-stalked with R^3, M^2 arising rather near end of cell. Hind wing only about half the length of fore wing, costal margin strongly concave, termen with long projecting teeth at SC^2 and R^1, otherwise sinuous rather than dentate, tornus moderate; cell about one-half, DC incurved; C approximated (but not appressed) to SC to near end of cell, then moderately diverging; SC^2 from close to end of cell; R^2 absent; R^3–M^1 long-stalked, M^2 from very near end of cell.

Type of the genus: *Sesquialtera ridicula*, sp. n.

SESQUIALTERA RIDICULA, sp. n. (Pl. II. fig. 11, ♀.)

♀, 32–36 mm. Head, body, and fore wing fuscous with darker irroration. Fore wing extremely weakly marked, a darker cell-mark and a postmedian line indicated, the latter remote from termen, strongly excurved at radials; sometimes also a vague, diffuse, oblique, somewhat curved antemedian line or shade indicated. Hind wing variable, in the type with the basal area blackish fuscous, the rest more concolorous with fore wing, but traversed by ill-defined ferruginous-brown bands, in other examples more uniform, the base being less blackened, the ferruginous scales largely suppressed; a blackish discal dot, crossed or closely preceded by the more or less sinuous antemedian (median) line and followed by a distinct postmedian (darker brown or blackish) sinuate inwards between radials and in submedian area; a brown or black terminal line. Under surface similar to upper, in the type less variegated in hind wing.

1909: May 12,—1 ♀ (type).

Also in Hope Department, Oxford, from British East Africa, 5 May, 1913, c. 1° S., 35° E., 5000–6000 feet, forest with open glades (*H. B. Popplewell*), 1 ♀. Also from Mt. Kenya in Paris Museum.

PACHYPALPIA SUBALBATA Warr.

Pachypalpia subalbata Warr. Nov. Zool. vii. p. 98 (1900).

1908: Oct. 25,—1 ♀.

Described from British East Africa. Known also from German East Africa.

ASCOTIS SELENARIA (Schiff.).

Phalæna Geometra selenaria [Schiff.] Schmett. Wien, p. 101 (1775).

Ascotis selenaria Hbn. Verz. Bek. Schmett. p. 313 (1826).

Trigonomelea semifusca Warr. Nov. Zool. xi. p. 475 (1904).

1909: May 10,—1 ♂.

Extraordinarily widely distributed in S. and E. Europe, Asia, and Africa.

Fam. SATURNIDÆ.

EPIPHORA ATBARINUS Butl.

1909: Oct. 14,—1 ♂, 2 ♀.

LUDIA HANSALI Feld.

1908: Oct. 29,—1 ♀. **1909**: Sept., 1 ♀. Year?: Apr. 27, —1 ♂ (B.M.).

Fam. ARBELIDÆ.

SELAGENA EUSTRIGATA, sp. n. (Pl. II. fig. 27, ♂.)

♂. Head and thorax white tinged with rufous, the dorsum of thorax with long spatulate chocolate-brown scales; antennæ with the branches rufous; pectus and legs white, the latter with brown mixed: abdomen white, the 2nd segment with dorsal tuft of long spatulate rufous and chocolate-brown scales, the anal tuft tinged with rufous and with spatulate black-brown scales mixed. Fore wing creamy white, with fine dark brown pencillings with white bars on them defined by black and leaving the veins white below base of costa, from medial part of cell to inner margin, in end of cell, between veins 5 and 2 to near termen, and forming a wedge-shaped subterminal patch between veins 8 and 6; a white patch with some rufous before and beyond it beyond the discocellulars, and a white spot with some rufous before and beyond it below vein 2 near its origin. Hind wing silvery white. Underside white; fore wing with the cell and area beyond it to near termen suffused with brown with some white striæ on it; hind wing with some red-brown striæ on medial part of costa.

1908: Sept. 13,—1 ♂ (type); Sept. 14,—1 ♂ (B.M.); Sept. 18,—1 ♂; Sept. 20,—1 ♂; Sept. 26,—1 ♂; Oct. 6,—1 ♂. **1909**: Sept.,—2 ♂. *Exp.* 20–24 millim.

SELAGENA ATRIDISCATA Hmpsn.

1909: Oct. 5,—1 ♀.

METARBELA DIODONTA, sp. n. (Pl. II. fig. 28, ♂.)

♂. Head and thorax dark reddish brown mixed with some grey-white, the frons whiter; palpi black-brown; pectus and legs red-brown mixed with some whitish; abdomen white tinged with brown and with chocolate-brown dorsal streaks at base and extremity, the anal tuft tipped with chocolate-brown. Fore wing white tinged with brown; a series of black-brown points below the costa; a black-brown subbasal point on median nervure with a slight dentate dark brown line from beyond it to inner margin; a very irregular patch of brown suffusion defined by black-brown on medial part of inner margin, indented above and below by white spots towards its extremity; a down-curved black-brown streak from middle of cell to lower angle with a point beyond it in the cell and an irregular oblique bilobate mark defined by black-brown in upper extremity of cell; an oblique strongly dentate dark line from below apex to inner margin at the medial patch with more prominent blackish teeth between veins 7 and 5 and some dark suffusion beyond it; a terminal series of geminate black points. Hind wing silvery white with a very faint brownish tinge and faint brownish terminal line. Underside white with a faint brownish tinge and series of small brown spots on costa of fore wing.

♀. Abdomen more suffused with brown; fore wing more suffused with brown, the streak in lower end of cell absent and the oblique dentate postmedial line very indistinct; hind wing strongly tinged with brown.

1908: Sept. 27,—1 ♂; Sept. 28,—1 ♂; Sept. 29,—1 ♂; Oct. 1,—1 ♂; Oct. 4,—1 ♀ (type); Oct. 11,—1 ♂ (type); Oct. 14,—1 ♂ (B.M.); Oct. 20,—1 ♂; Oct. 23,—1 ♂; Oct. 24,—1 ♂. **1909**: Sept.,—1 ♂. *Exp.* 22–26 millim.

METARBELA PERSTRIATA, sp. n. (Pl. II. fig. 29, ♀.)

♀. Head, thorax, and abdomen grey-white suffused with reddish brown. Fore wing creamy white, thickly irrorated with dark reddish brown and with numerous rather reticulate lines, formed by dark reddish-brown striæ and with obscure dark brown spots at middle and end of cell. Hind wing and underside whitish suffused with brown.

1908: Sept. 27,—1 ♀ (type). *Exp.* 22 millim.

ARBELODES RUFULA Hmpsn.

1909: Mar. 14,—1 ♂; Apr. 8,—1 ♂; May 10,—1 ♂.

Fam. COSSIDÆ.

AZYGOPHLEPS INCLUSA Wlk.

1909: May 13,—1 ♀.

DUOMITUS MESOSTICTA, sp. n. (Pl. II. fig. 30, ♂.)

♂. Head, thorax, and abdomen white mixed with dark brown, the metathorax almost entirely black-brown; palpi and tarsi black-brown. Fore wing white irrorated with reddish brown, the medial inner area with a shade formed by thicker irroration, extending before middle to above vein 1; a discoidal patch formed by similar irroration conjoined beyond lower angle of cell to a similar shade on terminal area, the cell, submedian interspace except on terminal area, and an oblique postmedial shade from costa whiter; elliptical black-brown medial spots above and below vein 1; cilia chequered dark brown and white at tips. Hind wing white, the cilia chequered with dark brown to vein 2. Underside of fore wing with the inner area white with a brown spot below middle of cell; hind wing with the costal area irrorated with brown.

1908: Apr. 29,—1 ♂; May 4,—1 ♂ (B.M.); Sept. 12,—1 ♂. **1909**: Oct. 7,—1 ♂ (type). *Exp.* 28–38 millim.

DUOMITUS STENIPTERA, sp. n. (Pl. II. fig. 31, ♂.)

♂. Head and thorax white mixed with red-brown and some black, the metathorax almost entirely black-brown; antennæ dark brown; tarsi black ringed with white; abdomen whitish suffused and irrorated with red-brown. Fore wing white with sparse strong black striæ, the inner area tinged with rufous to beyond middle; a wedge-shaped black-brown patch on costal area from base to near middle; a rather triangular black spot below end of cell with its upper extremity somewhat produced; a black-brown patch at end of cell extending to the costa; some small black spots on costa towards apex; a subterminal series of small more or less distinct clavate dark marks in the interspaces; cilia chequered reddish brown and white. Hind wing white, the cilia with some brown scales mixed. Underside white; fore wing with small black spots on costa and blackish spot below end of cell, the terminal area striated with brown; hind wing with the costal area finely striated with red-brown.

1908: Apr. 27, -1 ♂ (type). **1909**: May,—1 ♂. *Exp.* 28–38 millim.

DUOMITUS SIMILLIMA, sp. n. (Pl. II. fig. 32, ♂.)

♂. Head and thorax dark red-brown mixed with some whitish and black, the metathorax entirely black-brown; antennæ dark brown; tarsi black ringed with white; abdomen dark red-brown mixed with whitish at sides towards base. Fore wing grey-white suffused with red-brown and sparsely striated with strong black striæ, slighter on basal area, the medial area from costa to vein 1, the postmedial area from costa to vein 2, and the interspaces of terminal area whiter; a rather triangular black spot below the cell; subterminal series of slight clavate dark marks in the interspaces; cilia chequered dark brown and greyish. Hind wing whitish suffused with brown, the cilia obscurely chequered with dark brown. Underside of fore wing suffused with brown, the terminal area striated with brown, series of small black spots on costa and below terminal part of cell; hind wing whitish, the costal area suffused with brown, the costa towards apex and termen with some brown striæ.

1908: Sept. 20,—1 ♂ (type); Sept. 23,—1 ♂. *Exp.* 24–28 millim.

Fam. LASIOCAMPIDÆ.

TRICHIURA OBSOLETA Klug.

1908: Oct. 25,—1 ♂; Oct. 29,—1 ♂. **1909**: Mar. 14,—2 ♂; Apr. 8,—2 ♂; Apr. 11,—1 ♀; Apr. 15,—1 ♀; Oct. 14,—1 ♂, 1 ♀; Dec. 30, 1 ♂. **1910**: Jan. 2,—1 ♂; Mar. 10,—1 ♀; Mar. 13,—1 ♂.

ANADIASA SIMPLEX Pag.

1909: Apr. 8,—1 ♂.

CHILENA DONALDSONI Holl.

1908: Oct. 13,—1 ♂. **1909**: Feb. 20,—1 ♂; Mar. 26,—1 ♂; Mar. 29,—1 ♂; Apr. 1,—1 ♂; Apr. 5,—1 ♂; Apr. 6,—1 ♀; Apr. 10,—4 ♂; Apr. 14,—1 ♂; Apr. 20,—1 ♂. **1910**: Mar. 20, —1 ♂.

Fam. LIMACODIDÆ.

CŒNOBASIS CHLORONOTON, sp. n. (Pl. II. fig. 35, ♂.)

♂. Head and thorax emerald-green; antennæ fulvous yellow; palpi fulvous yellow, brownish at sides; tibiæ on inner side and the tarsi fulvous yellow, the tarsi with brown points on outer side; abdomen pale orange-yellow, the sides and ventral surface whitish at base. Fore wing emerald-green, the costal edge orange-yellow. Hind wing white tinged with emerald-green, especially towards termen; the cilia emerald-green. Underside of fore wing with the costal half fulvous brown, the inner half greenish white, the termen and cilia green; hind wing pale orange-yellow, the terminal area tinged with green; the cilia green.

1908: Oct. 12,—1 ♂. **1909**: Apr. 4,—1 ♂ (type); Apr. 8, —2 ♂ (1 in B.M.); Apr. 9,—1 ♂; Apr. 10,—1 ♂; Apr. 20, —1 ♂; Apr. 23,—1 ♂; Apr. 24,—1 ♂ (B.M.); Sept.,—1 ♂. *Exp.* 18–20 millim.

CŒNOBASIS FULVICORPUS Hmpsn.

1908: Sept. 26,—1 ♂; Oct. 24,—1 ♂. **1909**: Apr. 4,—1 ♂; Apr. 5,—1 ♂; Apr. 7,—3 ♂; Apr. 8,—2 ♂, 1 ♀.

Genus FEATHERIA, nov.

Type, *F. obvia.*

Proboscis absent; palpi obliquely upturned, short, not reaching to middle of frons, which is smooth; antennæ of male bipectinate with moderate branches to apex, of female with short branches: metathorax with spreading crest; tibiæ with the spurs moderate, the hind tibiæ with the medial spurs present; abdomen with rough hair at base of dorsum. Fore wing with the apex rounded, the termen evenly curved; veins 2, 3 shortly stalked, 5 from near angle; 6 from well below upper angle; 7 from just below angle; 8, 9 stalked: 10, 11 from cell. Hind wing with veins 3 and 5 from near angle of cell; 6, 7 stalked; 8 from middle of cell.

FEATHERIA OBVIA, sp. n. (Pl. II. fig. 33, ♂.)

♂ ♀. Head and thorax grey-white mixed with reddish brown; tarsi ringed with white; abdomen grey-white tinged with red-brown. Fore wing grey-white tinged in parts with reddish brown and irrorated with dark brown; a dark brown point at lower angle of cell, with an oblique brown line from it to inner margin slightly defined on outer side by whitish followed by a reddish-brown shade; an oblique dark-brown fascia from apex meeting the shade beyond the medial line, slightly incurved below vein 7, where there is a more or less elongate black spot beyond it, the oblique fascia followed by a whitish shade arising below apex; a terminal series of black-brown striæ. Hind wing white suffused with reddish brown; a fine darker brown terminal line and fine white line at base of cilia. Underside white tinged with reddish brown, the costal areas irrorated with brown.

Mandera.—**1908**: July 16,—1 ♂; Aug. 16,—1 ♂; Sept. 26,—2 ♂, 1 ♀; Sept. 27,—1 ♀ (type). **1909**: Mar. 24,—1 ♂ (type); Apr. 9,—1 ♂; Sept. 6,—1 ♀.

Gan Libbah.—**1908**: June 26,—1 ♀. *Exp.* ♂ 22, ♀ 28 millim.

PARYPHANTA FIMBRIATA Karsch (ARCUILINEA B.-B.).

1909: Mar. 26,—1 ♂; Apr. 10,—1 ♂.

SCOTINOCHROA MINOR, sp. n. (Pl. II. fig. 34, ♂.)

♂. Head, thorax, and abdomen bright chestnut mixed with fulvous yellow and some dark brown; antennæ fulvous. Fore wing bright chestnut irrorated with dark brown and rough silvery scales; an obscure dark mark below origin of vein 2; the postmedial area ochreous whitish with a very ill-defined band of dark and silvery scales, rather maculate to lower angle of cell, then excurved; a curved maculate subterminal band of dark and silvery scales from below costa to vein 2; a dark brown patch at apex. Hind wing yellow tinged with rufous, the cilia deeper rufous at tips. Underside yellow, the fore wing suffused with rufous, the hind wing tinged with rufous.

1909: Apr. 20,—1 ♂ (type). *Exp.* 18 millim.

GAVARA LEUCOMERA, sp. n. (Pl. II. fig. 36, ♀.)

♀. Head, thorax, and abdomen white, faintly tinged with rufous; fore tibiæ and the tarsi pale brown ringed with white. Fore wing white tinged with rufous except on terminal area, which is slightly irrorated with rufous; a rather oblique rufous antemedial shade from below costa to inner margin; a black point at lower angle of cell; an indistinct waved rufous line from lower angle of cell to inner margin; an indistinct sinuous rufous line from middle of costa to submedian fold above tornus, then incurved to inner margin; a distinct diffused rufous line from costa beyond middle to termen at submedian fold, excurved at middle; a terminal series of rufous striæ. Hind wing white tinged with rufous; a fine rufous terminal line; cilia white. Underside white, the fore wing suffused with rufous, the hind wing tinged with rufous.

1909: Apr. 8,—1 ♀ (type). *Exp.* 16 millim.

Fam. THYRIDIDÆ.

RHODONEURA HAMATIPEX, sp. n. (Pl. II. fig. 37, ♂.)

♂. Head, thorax, and abdomen ochreous suffused with rufous. Fore wing ochreous tinged with rufous and thickly reticulated with rufous striæ, browner at costa; a slight antemedial line forking towards costa and forming a slight fork towards inner margin; a narrow rather oblique postmedial band formed by two lines filled in with rufous except towards costa, the inner line curved inwards to costa and somewhat angled inwards at lower angle of cell and vein 1, the outer line excurved below costa, the band somewhat constricted at submedian fold, a reticulate band formed of double striæ beyond it from vein 7 to tornus; an oblique double line filled in with rufous across apical area from costa to termen at vein 4. Hind wing ochreous tinged with rufous and striated with rufous lines; a slightly curved antemedial line, dark point just above lower angle of cell, darker slightly sinuous medial line, two or three faint postmedial lines, and a more prominent subterminal line oblique to discal fold, then sinuous to tornus. Underside of fore wing with a streak formed by black spots and opalescent silvery scales below middle of cell and a short streak formed by black dashes beyond upper angle, the medial part of postmedial band, the subterminal band towards tornus, and the oblique band except at costa prominently filled in with rufous.

1909: Apr. 11,—1 ♂; Oct. 19,—1 ♂; Oct. 30,—1 ♂ (type). *Exp.* 22 millim. Closely allied to *R. squamigera* Pag.

Fam. PYRALIDÆ.

Subfam. CRAMBINÆ.

ANCYLOLOMIA PECTINIFERA Hmpsn.

1909: Mar. 10,—1 ♀; Mar. 14,—1 ♀.

SURATTHA SCITULELLUS Wlk.

1908: Sept. 18,—1 ♀; Sept. 20,—1 ♀; Sept. 21,—1 ♀; Sept. 22,—1 ♀; Sept. 24,—2 ♀; Sept. 26,—1 ♀. **1909**: Mar. 13,—1 ♀; Mar. 14,—1 ♀ (B.M.); Mar. 19,—1 ♀; Mar. 22, —1 ♀.

SURATTHA INVECTELLUS Wlk.

1908: Aug. 15,—1 ♂; Sept. 14,—1 ♂; Sept. 20,—1 ♂; Sept. 24, —1 ♂; Sept. 26,—1 ♀. **1909**: Feb. 15,—1 ♀; Feb. 16,—2 ♀; Feb. 23,—1 ♂; Mar. 5,—1 ♂; Mar. 11,—1 ♀ (B.M.); Mar. 13, —3 ♂, 4 ♀; Mar. 19,—1 ♂, 1 ♀ (♂ B.M.); Oct. 14,—1 ♀.

Subfam. SCHŒNOBIANÆ.

Genus CALAMOSCHŒNA, nov.

Type, *C. ascriptalis*.

Proboscis absent; palpi upturned, in male hardly reaching to middle of frons, in female to vertex of head; maxillary palpi minute; frons smooth, rounded; antennæ in both sexes laminate and almost simple; hind tibiæ with the outer medial spur minute. Fore wing with vein 3 from before angle of cell; 4, 5 shortly stalked; 6, 7, 8, 9 stalked; 10, 11 from cell. Hind wing with veins 3 and 5 from angle of cell, 4 absent; 8 anastomosing with 7.

CALAMOSCHŒNA ASCRIPTALIS, sp. n. (Pl. II. fig. 38, ♂.)

♂. Head and thorax pale ochreous; pectus, legs, and abdomen ochreous white. Fore wing uniform pale ochreous. Hind wing glossy white, the cilia tinged with ochreous at base. Underside white; fore wing with the costal half tinged with ochreous.

♀. Head and thorax slightly tinged with rufous; abdomen more ochreous; hind wing with the termen and cilia at base tinged with ochreous.

1908: Oct. 6,—1 ♂ (type). **1909**: Oct. 12, —1 ♀ (type). *Exp.* ♂ 20, ♀ 28 millim.

Subfam. PHYCITINÆ.

STAUDINGERIA SUB-OBLITELLA Rag.

1909: Feb. 15,—1 ♀.

EUZOPHERA VILLORA Feld. (STRAMANTELLA Rag.).

1909: June 10,—1 ♀.

NEPHOPTERYX METAMELANA Hmpsn.

1908: Sept. 16,—1 ♀; Sept. 18,—1 ♂.

NEPHOPTERYX ? EMUSSATATELLA Rag.

1908: Sept. 14,—1 ♀.

NEPHOPTERYX EUGRAPHELLA Rag.

1909: Oct. 11,—1 ♀.

NEPHOPTERYX SERRATELLA Rag.

1908: Feb. 24,—1 ♀; Sept. 12,—1 ♀; Sept. 19,—1 ♀ (B.M.); Sept. 26,—1 ♀ (B.M.); Oct. 12,—1 ♀; Oct. 20,—1 ♀; Oct. 25, —1 ♂ (B.M.); Nov. 18,—1 ♀. **1909**: Jan. 9, 1 ♀ (B.M.); Mar. 13,—1 ♀; Apr. 16,—1 ♀ (B.M.); Dec. 31,—1 ♀.

Subfam. EPIPASCHIANÆ.

MACALLA PURPUREOPICTA, sp. n. (Pl. II. fig. 39, ♀.)

♀. Head and thorax pale grey; pectus, legs, and abdomen cupreous rufous, the last with some blackish at base of dorsum. Fore wing with large tufts of raised hair-like scales below the cell before middle and in middle and end of cell; pale greyish and white and with some dark irroration beyond the cell, the area below the cell and vein 3 purplish rufous from before middle to tornus; a blackish antemedial line from cell to inner margin, slightly angled outwards at submedian fold, the tufts of scales in the cell grey-brown; blackish streaks on middle of vein 1 and basal half of veins 2 and 3, and a slight streak beyond upper angle of cell; an oblique black bar from origin of vein 7 to vein 5 near termen; a purplish-rufous patch on terminal part of costa with oblique purplish-rufous bar from it at vein 7 to vein 5 just before termen; a terminal series of dark striæ except towards tornus; cilia white tinged with rufous and with a pale brownish line near tips. Hind wing semihyaline white, the apical area suffused with red-brown to vein 4; a diffused purplish-red streak on terminal part of vein 2; a terminal series of red striæ, darker towards apex: cilia white, tinged with fiery red at base. Underside of both wings white, the costal and apical areas red.

1909: Apr. 9,—1 ♀ (type). *Exp.* 24 millim.

Subfam. ENDOTRICHINÆ.

ENDOTRICHA CONSOBRINALIS Zell.

Hargaisa.—1908: Oct.,—2 ♂.

Subfam. PYRALINÆ.

AGLOSSA INCULTALIS Zell.

1909: Feb. 17,—1 ♂.

AGLOSSA OMMATALIS Hmpsn.

1909: Mar. 8,—1 ♀.

AGLOSSA BASALIS Wlk.

1908: Sept. 17,—1 ♀; Sept. 24,—1 ♀; Sept. 26,—1 ♀; Sept. 30,—1 ♀. **1909**: Feb. 11,—1 ♀.

TEGULIFERA ZONALIS Warren.

1908: Nov. 3,—1 ♀.

TEGULIFERA NIGRICINCTALIS Hmpsn.

1908: Sept. 18,—1 ♂; Oct. 1,—1 ♀; Oct. 13,—1 ♀. **1909**: Apr. 14,—1 ♀; Apr. 22,—1 ♂.

TYNDIS PROTEANALIS Hmpsn.

1908: Aug. 24,—1 ♀; Aug. 27,—2 ♂; Sept. 3,—1 ♂; Sept. 12,—1 ♀; Sept. 15,—1 ♂; Sept. 16,—1 ♂; Sept. 18,—1 ♂, 1 ♀; Sept. 19,—1 ♂; Sept. 21,—1 ♂, 1 ♀; Sept. 22,—1 ♀. **1909**: Mar. 9,—1 ♀; Mar. 10,—1 ♀; Mar. 11,—1 ♂; Mar. 12,—1 ♂; Mar. 15,—3 ♂, 1 ♀; Mar. 18,—2 ♀; Mar. 19,—3 ♀; Mar. 20,—1 ♀; Mar. 21,—1 ♂, 1 ♀; Mar. 22,—4 ♀; Mar. 24,—1 ♀; Mar. 26,—2 ♀; Mar. 30,—1 ♂; Apr. 15,—1 ♀; Oct. 4,—1 ♀. Year?: Sept. 25,—1 ♂.

ZITHA SUBCUPRALIS Zell.

1908: Aug. 24,—1 ♂. **1909**: Feb. 23,—1 ♂; Feb. 28,—1 ♂; Mar. 4,—1 ♂; Mar. 9,—1 ♂.

BOSTRA VARIANS Butl.

1908: Sept. 13,—1 ♀; Sept. 16,—3 ♀; Sept. 19,—1 ♀. **1909**: Mar. 26,—1 ♀; Apr. 8,—2 ♀; Apr. 10,—2 ♀; Apr. 14, —1 ♀; Apr. 20,—1 ♀.

BOSTRA TENEBRALIS Hmpsn.

1908: Sept. 14,—1 ♂; Sept. 15,—1 ♂; Sept. 19,—1 ♂.

BOSTRA PYROCHROALIS, sp. n. (Pl. II. fig. 43, ♀.)

♀. Head, tegulæ, and abdomen whitish tinged with red-brown: thorax fiery red. Fore wing fiery red slightly irrorated with whitish, the costal edge with some dark scales towards base and alternating whitish and dark brown points on medial area; antemedial line white, slightly excurved below costa, then inwardly oblique; postmedial line white, slightly excurved to vein 4, then slightly incurved; cilia purple-brown at base, the tips white with some red at apex. Hind wing white tinged with red-brown; the cilia purple-brown at base, white at tips.

1909: Mar. 24,—1 ♀ (type). *Exp.* 16 millim.

DATTINIA PERSTRIGATA, sp. n. (Pl. II. fig. 40, ♂.)

Antennæ of male bipectinate, with long branches to near apex.

♂. Head and thorax creamy white more or less tinged with brown; antennæ with the branches brown; palpi irrorated with blackish; abdomen creamy white with dorsal fulvous yellow bands except at base and extremity, the anal tuft with pale blood-red subdorsal streaks. Fore wing with diffused blackish streaks below end of cell, above and below submedian fold and vein 1 to beyond middle, and on each side of veins 5 to 2; a small black spot in lower angle of cell and slight point in upper angle; the streaks partly interrupted by traces of a subterminal white line with blackish points before it on veins 7, 6; the costal half of wing sometimes irrorated with blackish: a terminal series of blackish points; cilia chequered with pale blood-red. Hind wing pure white and somewhat semihyaline.

Ab. 1. Fore wing with the streaks on each side of vein 1 and veins 5 to 2 beyond the cell with pale blood-red mixed, veins 7, 6 with pale blood-red streaks except on terminal area.

♀. Thorax strongly tinged with pale blood-red, the fore and mid tibiæ and tarsi suffused with blood-red, abdomen at sides and anal tuft blood-red; fore wing with the costa and cilia blood-red, diffused blood-red fasciæ above and below vein 1, the streaks on veins 7, 6 and on each side of veins 5 to 2 blood-red; an indistinct obliquely curved waved subterminal blood-red line between veins 7 and 1; hind wing suffused with brown, the veins towards termen and cilia suffused with blood-red; underside suffused with brown, the costal areas, veins towards termen, and cilia of both wings blood-red.

1908: July 1,—1 ♂; July 8,—1 ♂; July 19,—1 ♂; July 24, —1 ♂; Aug. 24,—1 ♀: Aug. 27,—1 ♂ (B.M.); Aug. 28,—1 ♂;

Sept. 21,—1 ♂; Sept. 23,—1 ♂; Sept. 24,—1 ♂; Sept. 26,—1 ♂ (type); Sept. 27,—1 ♂; Sept. 29,—1 ♂. **1909**: Jan. 18,—2 ♂, 1 ♀ (type); Mar. 14,—1 ♂, 2 ♀; Apr. 1,—1 ♂; Apr. 14,—1 ♂; May 12,—1 ♂; May 21,—2 ♂; Sept. 21,—1 ♂; Oct. 22,—2 ♂; Nov. 25,—1 ♀. **1910**: Mar. 6,—1 ♂; Mar. 9,—1 ♂; Mar. 10,—1 ♂; Mar. 12,—1 ♂ (B.M.). *Exp.* ♂ 36–40, ♀ 42 millim.

DATTINIA ORNATA Druce.

1908: Feb. 24,—1 ♂; Sept. 24,—1 ♀; Sept. 29,—1 ♀; Oct. 3,—1 ♂. **1909**: Mar. 14,—1 ♀; Mar. 18,—1 ♀; Mar. 19,—1 ♀; Mar. 26,—1 ♀; Apr. 16,—1 ♀; Oct. 8,—1 ♀; Oct. 11,—1 ♀.

DATTINIA PERATALIS, sp. n. (Pl. II. fig. 41, ♂.)

Antennæ of male bipectinate, with long branches to two-thirds length.

♂. Head, thorax, and abdomen ochreous tinged with rufous, the thorax deeper rufous; antennæ with the branches brown; frons and palpi deep rufous; legs red-brown, the tibiæ and tarsi ringed with whitish. Fore wing with the basal area rufous, the rest of wing silvery white with a creamy tinge suffused in parts with rufous; antemedial line creamy white defined on outer side by rufous and with some black irroration before it, slightly waved; the medial area mostly suffused with rufous, with a creamy-white patch in and beyond the cell extending to costa; an oblique black-brown discoidal bar and slight yellowish spot below end of cell; postmedial line creamy white defined on inner side by rufous, excurved to vein 3, then incurved, a patch of blackish scales beyond it at middle; a silvery whitish apical patch defined by rather diffused black scales. Hind wing ochreous white suffused with rufous; cilia with a white line at base followed by a rufous line. Underside whitish, the fore wing and costal area of hind wing suffused and irrorated with red-brown.

1909: Mar. 14,—1 ♂ (type). *Exp.* 14 millim.

DATTINIA COSTINOTALIS, sp. n. (Pl. II. fig. 42, ♂.)

Antennæ of male ciliated.

♂. Head, thorax, and abdomen grey mixed with reddish brown and fuscous, the vertex of head whitish; pectus whitish; tarsi brown ringed with white; abdomen blackish brown ventrally except towards base. Fore wing pale brownish grey slightly irrorated with blackish; the costal edge black towards base; subbasal line black defined on outer side by whitish, angled outwards below the cell and ending at vein 1; antemedial line black, oblique to below the cell, then incurved, a quadrate patch of blackish suffusion beyond it from costa to median nervure; a slight dark mark at lower angle of cell; postmedial line blackish, indistinct except towards costa, excurved to vein 4, then oblique and sinuous, an oblique black bar beyond it from costa; a terminal series of slight brown spots; cilia brownish white with two fine brown lines through them. Hind wing semihyaline white; a fine brown terminal line and slight line through the cilia.

1908: July 31,—1 ♂ (type). *Exp.* 18 millim.

CLEDEOBIA RADIALIS Hmpsn.

1908: July 17,—1 ♀; July 24,—1 ♂. **1909**: Mar. 26,—1 ♀; Apr. 8,—1 ♂; Dec. 10,—1 ♀.

Subfam. PYRAUSTINÆ.

ZINCKENIA FASCIALIS Cram.

1908: Sept. 30,—1 ♀. **1909**: Jan. 11,—1 ♀; Jan. 13,—1 ♀; May 5,—1 ♂.

SYLEPTA SABINUSALIS Wlk.

1908: Feb. 24,—1 ♀. **1909**: Oct. 7,—1 ♀; Oct. 14,—1 ♀.

GLYPHODES INDICA Saund.

1908: Oct. 27,—1 ♂. **1909**: May 14,—1 ♂.

AGATHODES MUSIVALIS Guen.

1909: May 10,—1 ♀.

CROCIDOLOMIA BINOTALIS Zell.

Berbera.—1908: Mar. 4,—1 ♂.

HELLULA UNDALIS F.

1909: Jan. 19,—1 ♀; Mar. 14,—2 ♀.

SAMEODES OCELLATA, sp. n. (Pl. II. fig. 44, ♀.)

Fore wing with scale-tooth on inner margin before middle.

♀. Head white, the frons with rufous spot, the antennæ and palpi fulvous red; thorax fulvous red; pectus and legs white, the latter tinged with red-brown; abdomen white dorsally suffused with rufous. Fore wing fulvous red; a large rounded white patch with pale red centre from upper angle of cell to inner margin, its edges slightly waved and a similar but smaller patch beyond the cell connected with the costa and extending to vein 4. Hind wing pale rufous. Underside whitish suffused with rufous.

1908: May 28,—1 ♀; Sept. 19,—1 ♀ (type); Sept. 24,—1 ♀. *Exp.* 16 millim.

LEUCINODES ORBONALIS Guen.

1908: Oct. 29,—1 ♀.

NOMOPHILA NOCTUELLA Schiff.

1908: Nov. 13,—1 ♂.

PACHYZANCLA PHÆOPTERALIS Guen.

1908: Sept. 20,—1 ♀.

PACHYZANCLA BASALIS Wlk.

1908: Feb. 24,—1 ♀. **1909**: Apr. 10,—1 ♀.

PACHYZANCLA BIPUNCTALIS F.

1908: Sept. 30,—2 ♀; Nov. 24,—1 ♀.

PHLYCTÆNODES NUDALIS Hübn.

1908: Sept. 26,—1 ♀; Sept. 29,—1 ♀.

ANTIGASTRA CATALAUNALIS Dup.

1908: Sept. 18,—1 ♀.

NOORDA BLITEALIS Wlk.

1909: May 10,— 2 ♀.

MECYNA GILVATA F.

Mandera.—1908: Sept. 3,—1 ♂; Sept. 11,—1 ♂; Nov. 13,—2 ♀; Nov. 14,—1 ♀; Nov. 18,—1 ♂. **1909**: Jan. 14,—1 ♀; May 9,—1 ♀; Oct. 19,—1 ♂; Oct. 22,—2 ♂; Nov. 10,—1 ♀.

Gan Libbah.—1908: June 25,—1 ♂.

PIONEA MELANOSTICTALIS, sp. n. (Pl. II. fig. 46, ♂.)

♂ ♀. Head and thorax grey tinged with brown, the vertex of head white; palpi red-brown, white at base; pectus and legs mostly white, the fore tibiæ and tarsi brown ringed with white; abdomen grey-brown with white segmental rings, the ventral surface white. Fore wing whitish tinged and irrorated with brown, the costal area browner; small antemedial black spots on subcostal and median nervures, vein 1, and above inner margin; a black point in the cell towards extremity and discoidal bar; postmedial line black, dentate to vein 4, then with oblique bar to vein 2, then retracted to below end of cell and excurved at submedian fold and slightly above inner margin; a curved series of blackish points just before termen and a terminal series. Hind wing whitish suffused with red-brown; traces of a curved brown postmedial line; a terminal series of slight brown points; cilia white with a faint brown line near base.

1908: Sept. 23,—1 ♀; Sept. 27,—1 ♀, 1 ♂ (type); Oct. 11,—1 ♀ (B.M.); Nov. 24,—1 ♀. *Exp.* 16 millim.

PIONEA RUBRITINCTALIS, sp. n. (Pl. II. fig. 45, ♀.)

♀. Head and thorax ochreous yellow tinged with rufous; frons with white lines at sides; palpi white in front at base; pectus and legs white; abdomen reddish ochreous, the ventral surface white. Fore wing ochreous yellow tinged with rufous; traces of an oblique rather diffused rufous antemedial line; a more distinct obliquely curved diffused rufous postmedial shade; cilia white at tips. Hind wing pale reddish ochreous with traces of a rather diffused curved rufous postmedial line.

1908: Sept. 24,—1 ♀. **1909**: May 10,—1 ♀ (type). *Exp.* 18 millim.

PYRAUSTA INCOLORALIS Guen.

1909: May 3,—1 ♀.

PYRAUSTA STHENIALIS, sp. n. (Pl. II. fig. 47, ♂.)

Mid tibiæ of male dilated with a fold containing a tuft of long hair, the hind tibiæ with the outer medial spur minute; abdomen very long with the anal tuft long.

Head, thorax, and abdomen pure white, the shoulders with grey stripes; frons and palpi towards tips tinged with grey. Fore wing semihyaline white; the costal area suffused with grey; oblique slightly curved grey postmedial and subterminal lines. Hind wing semihyaline white with faint curved greyish postmedial and subterminal lines.

1908: May 4,—3 ♂, 6 ♀; May 6,—1 ♀; May 28,—1 ♂; Sept. 29,—2 ♀ (1 in B.M.); Oct. 15,—1 ♀; Oct. 20,—1 ♂; Nov. 13,—2 ♂ (1 in B.M.); Nov. 18,—1 ♂ (type). **1909**: Apr. 16,—1 ♀ (B.M.). *Exp.* 22–24 millim.

PYRAUSTA CONISTROTALIS, sp. n. (Pl. II. fig. 48, ♀.)

♀. Head, thorax, and abdomen pale reddish brown tinged with grey, the vertex of head whitish; palpi rufous, white at base; pectus, legs, and ventral surface of abdomen white, the fore legs brown in front. Fore wing whitish tinged with reddish brown and thickly irrorated with dark brown, the costal area rather browner; antemedial line indistinct, dark, oblique towards costa, angled outwards at median nervure and vein 1 and incurved below the cell and above inner margin; a minute dark spot in the cell towards extremity and curved discoidal striga; postmedial line dark, waved, excurved from below costa to vein 3, then retracted to lower angle of cell and erect to inner margin; a terminal series of small dark spots; cilia with a dark line near base. Hind wing whitish suffused with brown especially on terminal area; an indistinct brown postmedial line, excurved from below costa to vein 2, where it is slightly angled inwards; cilia white with a dark line near base.

♂. Browner; fore wing with a faint purplish gloss.

1908: Oct. 23,—1 ♀ (type).

Also in B.M. from Br. E. Africa, N. Kavirondo, Maramas Distr., Ilala (*Neave*), 1 ♂. *Exp.* 22 millim.

SCELIODES LAISALIS Wlk.

1908: Sept. 26,—1 ♀; Nov. 13,—1 ♀. **1909**: Jan. 17,—1 ♀; Feb. 25,—1 ♀; Oct. 17,—1 ♀.

Cornifrons albidiscalis, sp. n. (Pl. II. fig. 49, ♂.)

Antennæ of male bipectinate with moderate branches to near apex; frontal prominence pointed at extremity, its lower edge produced to a point before extremity.

Head and thorax red-brown mixed with some white; antennæ ringed brown and white, the branches blackish in male; abdomen pale red-brown. Fore wing pale red-brown irrorated with darker brown especially on the veins; an oblique whitish shade from base of costa; a narrow white antemedial band defined by dark scales and with irregularly waved edges; a small rather elongate white spot defined by dark scales in middle of cell and a white discoidal bar also defined by dark scales, its lower extremity somewhat curved inwards; a narrow white postmedial band defined by dark scales and with minutely waved edges, angled inwards at veins 6, 3, 2 and outwards at submedian fold, excurved at middle and incurved to inner margin; a slight dark terminal line; cilia white at base followed by a dark line. Hind wing whitish suffused with brown especially in female; a slight brown spot at lower angle of cell and indistinct rather diffused curved subterminal line; cilia white with a brown line near base.

1908: May 4,—1 ♀; Sept. 28,—1 ♂ (type); Oct. 18,—1 ♂; Nov. 13,—1 ♀; Nov. 14,—1 ♂. **1909**: Apr. 5,—1 ♂; Apr. 7,—1 ♂, 2 ♀ (1 in B.M.); Apr. 10,—1 ♂. *Exp.* 20 millim.

Tegostoma comparalis Hübn.

1908: June 1,—1 ♀; Sept. 25,—1 ♀; Oct. 31,—1 ♀. **1909**: May 9,—1 ♂; May 10,—4 ♀.

Tegostoma subditalis Zell.

1909: May 8,—1 ♂.

Tegostoma bipartalis Hmpsn.

1908: Aug. 15,—1 ♀.

Noctuelia globuliferalis, sp. n. (Pl. II. fig. 50, ♂.)

♂. Head and thorax white mixed with rufous; palpi red-brown; fore tibiæ with brown bands near extremities; abdomen white with slight rufous dorsal bands and streaks on anal tuft. Fore wing white suffused with rufous; an indistinct rufous subbasal line; antemedial line red-brown, excurved above inner margin, a round white spot defined by red-brown on its outer side in and below the cell; rounded white spots defined by red-brown in and below end of cell; a postmedial white patch defined by red-brown except above below the costa, intersected by a red-brown streak on vein 7 and its outer edge indented by a wedge-shaped red-brown mark on vein 6, a white patch beyond it at apex and oblique elliptical white spot defined by red-brown below it; a dark brown terminal line; cilia white at base with a brown line near base and brownish tips. Hind wing white; an elliptical yellowish discoidal spot defined by brown and with brown line from it to above inner margin; a brown postmedial line from costa to vein 5 and elliptical white spot defined by brown between vein 5 and submedian fold; a dark brown terminal line; cilia with series of brown striæ near base and brownish tips.

1908: Oct. 29,—1 ♂ (type). *Exp.* 18 millim.

TINEINA.

By Jno. Hartley Durrant, F.E.S.

OLETHREUTIDÆ.

EUCOSMA Hb.

EUCOSMA SOMALICA, sp. n.

Antennæ fuscous. *Palpi* whitish ochreous, more or less mixed with fuscous on the outer side of the median joint. *Head* and *thorax* whitish ochreous, slightly tinged with pink; tegulæ brownish fuscous, mixed with reddish. *Fore wings* elongate, slightly dilated posteriorly, male without costal fold, apex obtuse, termen nearly straight, slightly oblique; whitish ochreous, striate with fuscous and pinkish, with fuscous markings outlined by shining pearly scales; the markings, which appear more or less irrorate with whitish owing to some of the scales being tipped with white, consist of a basal patch, obtusely angled on the cell, and an irregular central fascia · becoming attenuate, or even obsolete, toward the tornus, this fascia is outwardly connected with a subapical quadrate spot; the costa is strigulate with fuscous, there is also a fuscous apical spot and an interrupted terminal line; cilia whitish ochreous, with a pinkish gloss, traversed by two pale fuscous shade-lines. *Exp. al.* ♂ 18–27 ♀ mm. *Hind wings* with 3–4 stalked; fuscous; cilia whitish ochreous, traversed by two greyish fuscous shade-lines. *Abdomen* fuscous with paler transverse lines. *Legs* whitish ochreous; tarsi spotted with blackish.

Type ♂ (7248); ♀ (7249), Drnt. Det.

1908: Sept. 19,—1 ♂; Sept. 20,—1 ♀ (type); Oct. 24,—1 ♂ (type). **1909**: Jan. 20,—1 ♀. **1910**: Mar. 6,—1 ♀.

The female is a little darker than the male, the pearly scaling tending to become leaden, especially toward the tornus.

TINEIDÆ.

NOMIMA, gen. n.

(νόμιμος, η, ον = conventional.)

Type: *Nomima prophanes* Drnt.

Antennæ $\frac{5}{6}$, with projecting scales on each joint, giving a serrate appearance, and bipectinate 3, each pectination ciliate; basal joint without pecten. *Labial palpi* porrect, clothed beneath and at end; terminal joint short, concealed. *Maxillary palpi* and *haustellum* obsolete. *Head* rough-haired. *Thorax* smooth—perhaps slightly tufted posteriorly. *Fore wings* elongate, rather narrow, apex round-pointed, termen rounded, surface with tufts of raised scales: *neuration* 12 veins, all separate; 7 to apex, 3-4 basally approximate; 1 furcate at base. *Hind wings* 1, elongate-ovate, with small transparent space below cubitus near base; cilia $\frac{1}{3}$: *neuration* 8 veins, all separate; 4-7 nearly parallel. *Abdomen* rather slender. *Legs*: posterior tibiæ long-haired above.

NOMIMA PROPHANES, sp. n.

Antennæ fuscous. *Palpi* yellowish ochreous. *Head* and *thorax* dark brownish fuscous; face yellowish ochreous. *Fore wings* cream-ochreous, with a dark brownish fuscous basal patch, and with a rather broad patch of the same colour commencing before the tornus and extending around the termen to the apex; the whole wing is ornamented with glistening spots of raised scales arranged in transverse lines—these raised spots have some admixture of bluish leaden-metallic, especially on the dark patches, and on the ochreous part of the wing transverse lines of pale greyish scaling occur between them; cilia shining, dark brownish fuscous with a purplish gloss, cream-ochreous along their base and above the apex; underside suffused with fuscous, except on a yellowish ochreous apical patch. *Exp. al.* 21–25 mm. *Hind wings* shining, pale grey with brassy sheen, more or less suffused with dark fuscous above and beneath in some specimens; cilia pale yellowish ochreous. *Abdomen* yellowish ochreous, dusted with fuscous. *Legs* yellowish ochreous, tarsi tinged with fuscous.

Type ♂ (7253), Drnt. Det.

1908: Sept. 30,—1 ♂. **1909**: Apr. 10,—1 ♂ (type); Apr. 15, —1 ♂.

ACHTHINA, gen. n.

('αχθεινός, ή, όν = irksome.)

Type: *Achthina ctenodes* Drnt.

Antennæ ♀ bipectinate 2; basal joint without pecten. *Labial palpi* rather short, upcurved; terminal joint very short. *Maxillary palpi* and *haustellum* obsolete. *Head* rough. *Thorax* smooth. *Fore wings* with costa straight, apex round-pointed, termen and tornus evenly rounded: *neuration* 12 veins; 7-8 stalked, 8-9 stalked enclosing apex, 10 out of stalk of 7-9; 4-5 closely approximate, connate or short-stalked; 3 from angle, 2 at least twice as far from 3 as 3 is from 4; 1 basally furcate. *Hind wings* 1, rather short and broad, apex and tornus bluntly rounded: *neuration* 8 veins; 3-5 approximate, 2 remote from 3, 5 bent over and closely approximate to 4, or 4-5 stalked; 6-7 stalked or separate; media to below 6. *Abdomen*: female moderate, ovipositor exserted. *Legs*: hind tibiæ long-haired above.

The male is at present unknown, and there is some variation in the neuration, but the pectinate antennæ and exserted ovipositor of the female distinguish this genus from its allies.

ACHTHINA CTENODES, sp. n.

Antennæ and *palpi* cinereous. *Head* and *thorax* cinereous with some admixture of fuscous. *Fore wings* cinereous, with some admixture of whitish, clearly and distinctly, but irregularly strigulate with blackish, to the number of about 12 or 13 complete lines, some reduplicate in part and with paler intermediate lines; cilia cinereous with a fuscous line near their base, and another toward their tips. *Exp. al.* 20 mm. *Hind wings* fuscous; cilia with a pale line near their base. *Abdomen* fuscous. *Legs* cinereous.

Type ♀ (7256), Drnt. Det.

1908: Sept. 18,—1 ♀; Sept. 27,—1 ♀ (type).

MELASINA Bdv.

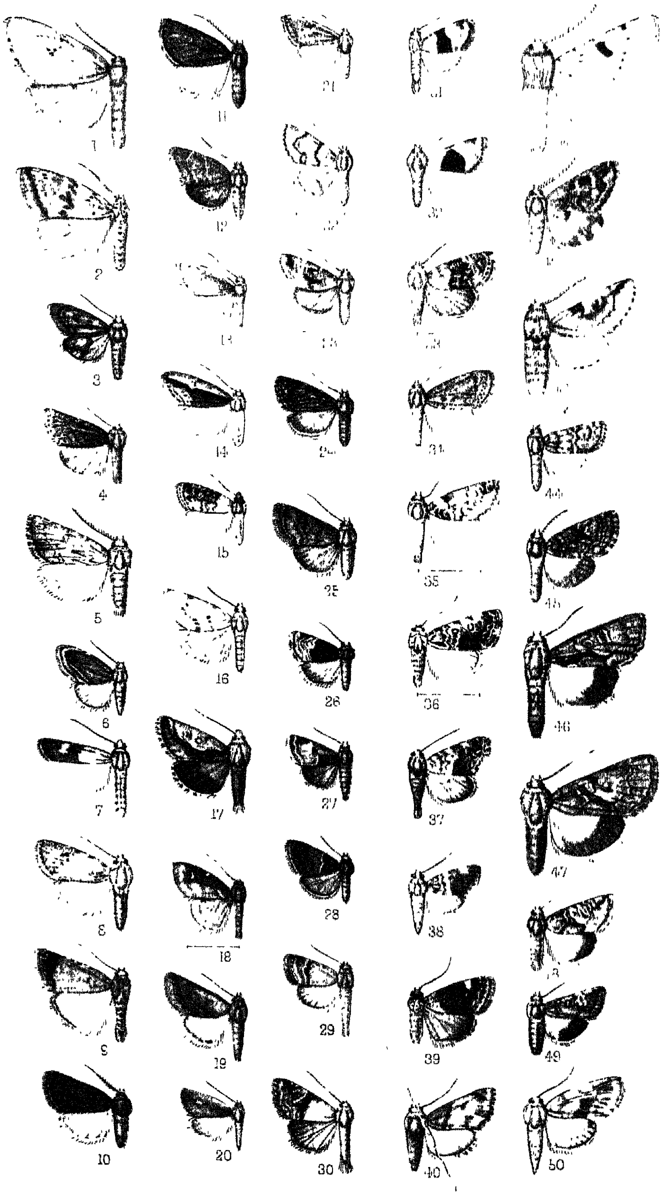
MELASINA PSEPHOTA, sp. n.

Antennæ whitish ochreous, spotted with fuscous; male pectinate 5. *Palpi* moderate, densely scaled; whitish ochreous mixed with dark fuscous. *Head* whitish ochreous. *Thorax* whitish mixed with dark fuscous; with a dark fuscous tuft posteriorly. *Fore wings* elongate, costa somewhat arched, apex obtuse, termen obliquely rounded, with 12 veins, all separate; chalky white, strigulate and shaded with fuscous, and with the transverse markings more or less continuously edged with blackish; a fuscous basal patch, slightly angulate outward on the fold, is edged with dark fuscous except on the costa and dorsum, there is however a dark costal spot before the end of the patch with some trace of dark spots crossing the wing; at one-third from the base a more or less irregular, outwardly oblique, fuscous fascia crosses the wing, generally widening out from the costa and narrowing below the fold, with outward extension above the fold in the direction of a dark fuscous spot at the end of the cell, occurring on an oblique fuscous fascia extending, more or less conspicuously, from costa to tornus—in some specimens this fascia is connected with a fuscous costal patch preceding the apex; cilia chalky white, with two fuscous parting lines more or less interrupted by four or five whitish bars. *Exp. al.* ♂ 21–24 mm., ♀ 34 mm. *Hind wings* pale fuscous; cilia whitish, with a fuscous line near their base. *Abdomen* fuscous; female with long exserted ovipositor. *Legs* pale fuscous; anterior and median tarsi barred with dark fuscous.

Type ♂ (7260); ♀ (7261), Drnt. Det.

1909: Jan. 19,—1 ♂; Feb. 16,—1 ♂; Feb. 17,—1 ♂; Feb. 19,—1 ♂; Feb. 20,—1 ♂; Feb. 21,—1 ♂; Feb. 22,—1 ♂; Feb. 27,—1 ♂; Mar. 9,—1 ♂; Mar. 10,—1 ♂; Mar. 13,—2 ♂; Mar. 14,—1 ♀ (type); Mar. 20,—1 ♂; Mar. 26,—1 ♂ (type).

Closely allied to *recondita* Drnt., but the hind wings are distinctly broader and the termen is more erect above vein 3, where there is a slight angle, not noticeable in *recondita* which has the wings narrower and more pointed.



Horace Knight del et lith

West, Newman chr

SOMALILAND LEPIDOPTERA.

MELASINA RECONDITA, sp. n.

Antennæ pale fuscous; male pectinate 5. *Palpi* moderate, densely scaled; pale fuscous. *Head* pale fuscous. *Thorax* whitish cinereous mixed with dark fuscous; with a dark fuscous tuft posteriorly. *Fore wings* elongate, rather narrow, termen oblique; whitish cinereous, strigulate with blackish, and with pale fuscous markings more or less continuously edged with blackish; a basal patch is indicated by fuscous suffusion; on the costa at one-third commences an irregular pale fuscous fascia, contracted (sometimes interrupted) on the cell, thence widening, but becoming narrow from the fold to the dorsum; this fascia is connected to a pyriform costal patch of the same colour by a larger pyriform patch on the disc with some extension toward the tornus—these markings usually reach to the costa before the apex, but are sometimes disconnected; a rather conspicuous discal spot, irregular in outline, occurs at the end of the cell on the fuscous patch, below a small, oblong, dark-margined fuscous patch; cilia whitish cinereous, with seven or eight broad fuscous bars beyond a narrow fuscous dividing line. *Exp. al.* ♂ 22-27 mm.; ♀ 33-39 mm. *Hind wings* fuscous; cilia whitish, with a fuscous line along their base. *Abdomen* fuscous; female with long exserted ovipositor. *Legs* cinereous; tarsi barred with fuscous.

Type ♂ (7275); ♀ (7276), Drnt. Det.

1909: Mar. 9,—1 ♂; Mar. 10,—2 ♂ (including type); Mar. 11, —1 ♂; Mar. 12,—2 ♂; Mar. 13,—5 ♂; Mar. 15, —1 ♂; Mar. 17, —1 ♂; Mar. 18,—1 ♂; Mar. 19,—1 ♂, 1 ♀ (type); Mar. 21,— 1 ♂; Mar. 26,—2 ♀. **1910**: Mar. 16,—1 ♂.

EXPLANATION OF THE PLATES.

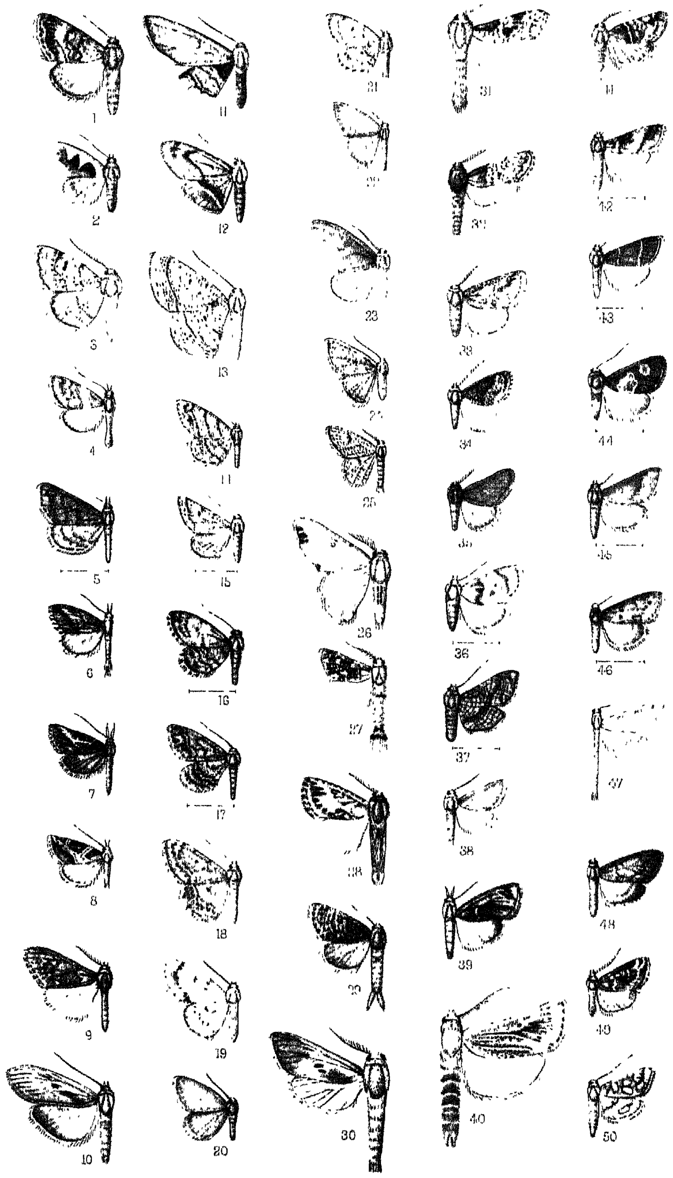
PLATE I.

Fig.		
1.	*Estigmene griseata*	♀.
2.	*Secusio somaliensis*	♀.
3.	*Chloridea albivenata*	♀.
4.	*Thalatha melanostrota*	♂.
5.	*Matopo heterochroa*	♂.
6.	*Acroriesis ignifusa*	♀.
7.	*Odontoretha featheri*	♂.
8.	*Athetis discopuncta*	♀.
9.	,, *ectomelæna*	♂.
10.	*Ethiopica ignecolora*	♀.
11.	,, *phæocausta*	♀.
12.	*Pachycoa olivacea*	♀.
13.	*Rabila albiviridis*	♂.
14.	*Acrapex albicostata*	♂.
15.	*Euterpiodes pictimargo*	♂.
16.	,, *croceisticta*	♂.
17.	*Paratuerta nana*	♂.
18.	*Enispa flavipars*	♂.
19.	*Eublemma eremochroa*	♂.
20.	,, *ochricosta*	♀.
21.	,, *arenostrota*	♂.
22.	*Toana nigrilineata*	♂.
23.	*Chionoxanthia leucophæa*	♂.
24.	*Œdicodia strigipennis*	♂.
25.	,, *melanographa*	♀.
26.	*Ozarba semitorrida*	♂.
27.	,, *endoscota*	♀.
28.	,, *hemipyra*	♀.
29.	,, *hemisarca*	♂.
30.	,, *exolivacea*	♂.
31.	,, *mesozonata*	♂.
32.	,, *endoplaga*	♂.
33.	*Eulocastra argyrostrota*	♂.
34.	*Aulotarache plumbeogrisea*	♀.
35.	*Constantiodes pyralina*	♂.
36.	*Hoplotarache ectorrida*	♂.
37.	,, *cæruleopicta*	♂.
38.	*Tarache mesoleuca*	♂.
39.	,, *miogona*	♀.
40.	*Eutelia grisescens*	♂.
41.	*Acanthonyx seriopuncta*	♂.
42.	*Cerocala albimacula*	♂.
43.	*Auchenisa cerurodes*	♂.
44.	*Authadistis camptogramma*	♂.
45.	*Catephia pyramidalis*	♂.
46.	,, *pericyma*	♂.
47.	,, *poliochroa*	♀.
48.	,, *mesonephele*	♂.
49.	,, *eurymelas*	♂.
50.	*Lyncestis diascota*	♂.

PLATE II.

Fig.		
1.	*Asplenia rubrescens*	♂.
2.	*Tephrias trigonosema*	♀.
3.	*Plecoptera polymorpha*	♂.
4.	*Magulaba grisea*	♂.
5.	*Naarda nigripalpis*	♂.
6.	*Rhynchina endoleuca*	♂.
7.	,, *perangulata*	♀.
8.	,, *albiscripta*	♂.
9.	*Aclonophlebia inconspicua*	♂.
10.	*Scrancia discomma*	♀.
11.	*Sesquialtera ridicula*	♀.
12.	*Cœnina tergimacula*	♂.
13.	*Tephrina prionogyna*	♀.
14.	*Discalma calvifrons*	♂.
15.	,, *puerilis*	♂.
16.	*Ptychopoda aperta*	♂.
17.	,, *subtorrida*	♀.
18.	*Acidalia pyrrhochra*	♀.
19.	,, *timida*	♀.
20.	,, *minoa*	♀.
21.	*Tricentroscelis protrusifrons*	♀.
22.	*Eucrostes astigmatica*	♀.
23.	*Hierochthonia featheri*	♀.
24.	*Neromia manderensis*	♀.
25.	*Prasinocyma perpulverata*	♂.
26.	*Victoria sematoperas*	♂.
27.	*Solagena eustrigata*	♂.
28.	*Metarbela diodonta*	♂.
29.	,, *perstriata*	♀.
30.	*Duomitus mesosticta*	♂.
31.	,, *stenipt era*	♂.
32.	,, *simillima*	♂.
33.	*Featheria obvia*	♂.
34.	*Scotinochroa minor*	♂.
35.	*Cœnobasis chloronoton*	♂.
36.	*Gavara leucomera*	♀.
37.	*Rhodoneura hamatipex*	♂.
38.	*Calamoschœna ascriptalis*	♂.
39.	*Macalla purpureopicta*	♀.
40.	*Dattinia perstrigata*	♂.
41.	,, *peratalis*	♂.
42.	,, *costinotalis*	♂.
43.	*Bostra pyrochroalis*	♀.
44.	*Sameodes ocellata*	♀.
45.	*Pionea rubritinctalis*	♀.
46.	,, *melanostictalis*	♂.
47.	*Pyrausta sthenialis*	♂.
48.	,, *conistrotalis*	♀.
49.	*Cornifrons albidiscalis*	♂.
50.	*Noctuelia globuliferalis*	♂.

[illegible] POULTON. Pl. II



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SOMALILAND LEPIDOPTERA.

From the ANNALS AND MAGAZINE OF NATURAL HISTORY,
Ser. 8, Vol. xii., *July* 1913.

Descriptions of new Species of African Heterocera in the Oxford Museum. By G. T. BETHUNE-BAKER, F.L.S., F.Z.S.

Notodontidæ.

Stauropus dambæ, sp. n.

♀. Head and thorax chocolate-brown, with a large admixture of greenish rough scales. Primaries creamy grey, thickly irrorated with green and dark red-brown scales; the postmedian deeply crenulate line, more or less obscured, is dark red-brown; submarginal line dark red-brown, deeply waved, prominent, and continued along the fold across the middle of the cell and less distinctly along the costa; this somewhat unusual marking should serve to easily discriminate the species. Secondaries pale brown, with the usual *Stauropus* apical mark.

Expanse 47 mm.

Hab. Damba Island, on the Equator in the Victoria Nyanza, 20 miles south-east of Entebbe.

Type in the Oxford Museum.

Dr. Carpenter found the larva on April 12th; it spun up on the 14th of that month, and the imago emerged on May 2nd following.

Peratodonta bella, sp. n.

♂. Head and face tawny brown; collar prominent, ochreous, broadly tipped with tawny brown; thorax purplish grey, with patagia pinkish; abdomen with dorsum pinkish grey; ventral surface purplish grey. Primaries with dark linear costa, below which they are tawny brown, gradually becoming paler and shading off into pale pinkish, and in parts of the cell to cream-colour; an oblique more or less wedge-shaped patch of dark tawny brown occupies the terminal area, beginning in a fine line in the apex and getting rapidly wider to vein 2; below vein 2 the whole of the inner margin is pale tawny ash-colour; in the middle of the terminal area is an irregular, pale bright olive-brown, tooth-shaped mark extending shortly upwards towards the apex. Secondaries uniform cream-colour.

♀. Like the male, but without the sharp contrasts, the colours being duller, more uniform, the terminal area being pinkish rather than tawny, whilst the secondaries are darkish brownish grey; the last segment of the abdomen has a pale ash-grey tuft.

Expanse, ♂ 38, ♀ 49 mm.

Hab. Oni, 70 miles E. of Lagos.

Types in the Oxford Museum.

Male taken by W. A. Lamborn in the verandah of his house at Oni Camp, 4 P.M., Sept. 9, 1911; the female at 3 P.M. on Sept. 10. A second male was taken in the same position at 4 P.M. on Sept. 9. Mr. Lamborn is confident that all three specimens had emerged from the pupæ of captured larvæ that had escaped. Mr. Lamborn also captured a third male at rest on the upperside of a leaf in the forest, 1 mile east of Oni, March 23, 1911. All four specimens appeared in the wet season, which lasted from March 15 to Dec. 8, 1911.

Arctiadæ.

Acantharctia rubrifemora, sp. n.

Head, face, thorax, abdomen, and both wings pure white; legs white, with bright red femora above. Primaries with all the veins edged with pale greyish brown. Secondaries spotless.

Expanse 45 mm.

Hab. Damba Island, Uganda.

Type in the Oxford Museum. Bred by Dr. Carpenter, June 25, 1911, from a larva which spun June 9.

Lymantridæ.

Lælia rogersi, sp. n.

♀. Head, thorax, and abdomen creamy grey. Primaries pale ochreous grey, with three parallel, oblique, wavy darker lines; basal area paler grey. Secondaries subhyaline whitish, without any marks.

Expanse 35 mm.

Hab. Fort Hall (Kikuyu), B.E. Africa.

Type in the Oxford Museum. Taken by the Rev. K. St. A. Rogers on March 20, 1907.

Lælia acuta, sp. n.

♀. Head and thorax pale rufous brown; abdomen dirty cream-grey. Primaries pale rufous brown, somewhat paler on the fold and in the postmedian area, the only mark being an obscure dark greyish oblique stripe from the costa close to the apex to near the middle of the cell. Secondaries pale straw-colour.

Expanse 36 mm.

Hab. Damba Island, Uganda.

Type in the Oxford Museum. Bred Sept. 24, 1911, from a larva found by Dr. Carpenter.

Cifuna nigroplagata, sp. n.

♀. Head, thorax, abdomen, and both wings dull cinnamon-brown. Primaries with a large blackish patch at the end of the cell extending to the costa; from the angle of vein 3 an obscure trace of an oblique darker stripe to the middle of the inner margin; a trace of a submarginal irregular line, with some dark points in the upper radial portion; fringes darkly intersected. Secondaries with an obscure dark dash closing the cell; a submarginal indefinite irregular band of darker shading; fringes unicolorous.

Expanse 36 mm.

Hab. Damba Island, Uganda.

Type in the Oxford Museum. Bred July 12, 1911, from a larva found by Dr. Carpenter. The cocoon was spun July 1.

Dasychira geoffreyi, sp. n.

♂ ♀. Head and thorax grey, very finely irrorated with brownish; abdomen ochreous grey. Primaries pale ochreous grey, with fine brown irrorations sparsely spread in the cell and fold, very thick on the costa and beyond the cell in the costal area, but less thick on the terminal area; a trace of a basal irregular line; a darkly outlined spot closing the cell, with a crenulate postmedian fine dark line; termen and fringes darkly spotted. Secondaries ochreous grey, becoming greyer towards the termen.

Expanse, ♂ 38, ♀ 50 mm.

Hab. Damba Island, Uganda.

Types in the Oxford Museum. Bred from larvæ found by Dr. Carpenter. First cocoon was spun May 4, 1911; the first emergence occurred May 17–18.

There is one specimen much more prominently and darkly marked, so that it is possible there may be a fair range of variation with this species, as is the case with some others of the genus.

Dasychira umbrensis, sp. n.

♂ ♀. Head, thorax, abdomen, and both wings dull darkish brown, of a mottled appearance, with very little definite marking. Primaries with three dark dots at the lower angle of the cell arranged in an inverted triangle; an obscure, dark, irregular, strongly serrate postmedian line; a series of submarginal interneural dark spots; fringes spotted in both wings. Secondaries uniform in colour.

Expanse, ♂ 43, ♀ 48 mm.

Hab. Damba Island, Uganda.

Types in the Oxford Museum. Bred from larvæ found by Dr. Carpenter. First cocoon was spun July 15, 1911, and the first moth emerged July 26.

Dasychira carpenteri, sp. n.

♂. Primaries very pale grey, with a dark basal line, highly dentate; a double irregular median line, enclosing a whitish space in which is a dark dot; the outer line is highly scalloped; beyond this is another interrupted serrate line; cell closed by a dark crescent, with a small spot in the crescent, above which and slightly further out is a dark costal patch, followed by a double crenulate postmedian line; termen with an irregular series of dark spots; the wing is dusted a good deal with very fine brownish scales. Secondaries straw-yellow, with a broad darkish border tapering down to the anal angle.

♀. Similar to the male, but darker grey, with the lines less prominent and with the crescent-shaped mark closing the cell developed into a fair-sized spot.

Expanse, ♂ 40, ♀ 50 mm.
Hab. Damba Island, Uganda.
Types in the Oxford Museum.

The male and female were captured *in copulâ* by Dr. G. D. H. Carpenter in the first half of June, 1911, on the shore on the E. side of Damba Island. Dr. Carpenter has also bred a series of seven specimens from larvæ taken on Damba Island. Cocoons were first spun June 3, 1911, and the first moth emerged June 13. Three specimens, apparently of this species, exist unnamed in the British Museum. The locality given is Ilesha, N. Nigeria.

Agaristidæ.

Schausia flavifrons, sp. n.

♂. Both wings black, with white patches. Primaries with a white basal point; a small white subovate patch in the cell; a large, long, oblong postmedian patch; a leaden basal stripe; a very oblique leaden stripe across the hinder third of the cell; cell closed with a leaden crescent; an oblique leaden subapical stripe and a trace of one below the costa. Secondaries with a large subhyaline white central patch to well beyond the cell. Palpi, frons, collar, and pectus bright orange.

Expanse 48 mm.
Hab. Mombasa.
Type in the Oxford Museum. Collected by the Rev. K. St. A. Rogers on March 13, 1906.

Lasiocampidæ.

Gastroplakæis idakum, sp. n.

♀. Head, face, and terminal segments of abdomen pale orange-grey; thorax and abdomen pale ochreous grey, the latter being the paler. Primaries pale ochreous grey, irrorated finely with darker grey; costa finely ashen grey, with an enlarged ashen area in front of the apex; a trace of a fine grey, crenulate, median line; the fine, very oblique, crenulate postmedian line is grey, and is followed by an irregular very oblique line of grey shading; a blackish spot closes the cell. Secondaries uniform pale straw-colour.

Expanse 60 mm.
Hab. Idakun, 4 miles N.W. of Oni Camp (Lagos district).
Type in the Oxford Museum. The larvæ were found by W. A. Lamborn on the 2nd of February, 1912; they spun

their cocoons on the 7th, and emerged on the 23rd of March in that year.

Mr. Lamborn's note, dated 24th March, 1912, is as follows:—"The larvæ were pale green in colour, with a median longitudinal black band on the dorsal aspect, and they were covered with short hairs. The thoracic legs were brilliant scarlet. When one touched a larva it suddenly threw back the anterior portion of its body, bringing the ventral surface uppermost, so that the legs were prominently displayed. They were then quivered violently."

Three larvæ, all of the same age, were found on one small plant, growing at the side of a forest-path.

Zygænidæ.

Saliunca egeria, sp. n.

♂. Head, antennæ, thorax, and abdomen black; patagia chestnut-brown. Primaries chestnut-brown, rather darker on the fold and towards the termen; a long, dusky, wedge-shaped mark between veins 5 and 8, rapidly tapering through the cell. Secondaries uniform sooty brown.

Expanse 30 mm.

Hab. Bugalla, Sesse Islands, in the N.W. of the Victoria Nyanza.

Type in the Oxford Museum.

This specimen, the only one seen by Dr. Carpenter, was captured at rest on a grass-stem, Jan. 21, 1912, in an open grassy area on the island. Dr. Carpenter notes that at rest the wings are disposed flat over the back, with costal margins [? inner margins] loosely apposed. In this attitude the moth closely resembles some of the Lycid beetles which are common on the island.

VII. *Note sur* Lucanides *conservés dans les collections de l'Université d'Oxford et du British Museum.* Par M. H. Boileau, F.E.S.

[Read October 16th, 1912.]

Plate IX.

Parmi les auteurs qui se sont spécialement occupés de l'étude des Lucanides, il faut citer au premier rang le Professeur Westwood et le Major Parry auxquels on doit un très grand nombre de descriptions et de remarques utiles.

Beaucoup d'autres descriptions plus anciennes sont indiquées dans les publications sous le nom du Révérend Hope, mais il est juste de dire que certaines d'entre elles paraissent en réalité devoir être attribuées à Westwood. Il semble que l'on puisse, en particulier, considérer comme telles les descriptions des *n. sp.* insérées dans le Catalogue publié en 1845 sous le titre: "A Catalogue of the Lucanoid Coleoptera in the Collection of the Rev. F. W. Hope." Cette brochure porte en effet un sous-titre: "With descriptions of the new species therein contained," au dessous duquel, sur certains exemplaires,* se trouve la mention manuscrite, de la main de Westwood, "by J. O. Westwood." Il est extrêmement probable que ces descriptions, qui ne sont guère que de courtes diagnoses, sont bien dûes à Westwood et que la mention "Hope" qui suit le nom des *n. sp.* décrites est une simple indication de catalogue, n'ayant pas plus de valeur que la mention "Catalogue Dejean" donnée pour certaines espèces également citées dans cet opuscule.

Quoi qu'il en soit, l'ensemble des descriptions de Hope, Westwood et Parry constitue encore maintenant une des bases importantes de l'étude des Lucanides, aussi ai-je été particulièrement heureux en 1906, de profiter d'un court voyage en Angleterre pour examiner le plus grand nombre possible des types décrits par ces auteurs. Ceux auxquels le nom de Hope a été attaché sont, pour la plupart, conservés au musée de l'Université d'Oxford. M. le Professeur Poulton, que je ne saurais assez remercier de son excellent accueil, a poussé l'obligeance jusqu'à me confier quelques-uns de ces précieux spécimens que j'ai ainsi pu étudier avec tout le soin désirable. Dans ce même musée et dans les riches collections du British Museum, où j'ai trouvé, grâce à MM. Waterhouse et G. Arrow, les plus grandes facilités d'étude, se trouvent également de nombreux types de Westwood et de Parry, ainsi que plusieurs espèces remarquables, décrites par M. Waterhouse.

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* Un de ces exemplaires, ayant été envoyé à Snellen von Vollenhoven par Westwood a été mentionné par Albers (Deutsch. Ent. Zeitschr., 1884, p. 301) qui a signalé le fait et ses conséquences. Je possède également un de ces catalogues à titre modifié par Westwood et je présume qu'il en existe d'autres.

Beaucoup de ces espèces sont, en fait, restées tout à fait inconnues de la plupart des spécialistes, les anciennes diagnoses étant absolument insuffisantes pour les caractériser, aussi ai-je pensé qu'il ne serait pas inutile de résumer les résultats de l'étude que j'en ai pu faire, quelque incomplète qu'elle soit en raison du peu de temps dont j'ai disposé à Londres et à Oxford. J'ai joint à ces notes, quelques-uns des croquis faits sur place, bien qu'ils ne soient pas ce que j'aurais désiré donner ici. Une revision analogue, mais d'une tout autre importance, a été faite par le Major Parry au moment de l'établissement de son premier Catalogue.* Il est évident que pour ce travail considérable et de haute valeur, Parry a dû examiner les types conservés à Oxford, vraisemblablement avec l'aide de Westwood. A ce moment, les matériaux d'étude dont on disposait, lui permirent déjà de très nombreuses rectifications. Mais, pour plusieurs espèces, des doutes ont subsisté, et j'aurai plus loin l'occasion de montrer que dans certains cas la synonymie adoptée d'après Parry est erronée et doit être rectifiée. Nous avons en effet maintenant, non pour toutes, mais pour la plupart des espèces anciennes, des éléments de comparaison bien plus considérables que ceux auxquels avaient recours les anciens descripteurs et il nous est ainsi devenue possible de reconnaître leurs erreurs. Celles-ci sont d'ailleurs bien excusables quand il s'agit d'insectes tellement variables dans leur forme et leur taille qu'à plusieurs reprises les spécialistes les plus autorisés ont réuni des espèces très distinctes, ou séparé sous deux, trois et même quatre noms les différents développements de la même espèce.

Les observations dont je donne ici le résumé, portent sur tous les types qu'il m'a été possible de reconnaître en examinant les collections. La plupart de ceux-ci ont d'ailleurs été identifiés depuis longtemps par les entomologistes éminents qui ont eu la charge des collections et se trouvent très correctement étiquetés. Ces précieux spécimens sont, en général, tant à Londres qu'à Oxford, dans un état de conservation des plus satisfaisants. Leurs anciennes étiquettes ont, le plus souvent, été scrupuleusement conservées, précaution qui a une importance considérable et qui permet, dans bien des cas, de reconnaître si tel ou tel spécimen se rapporte ou non aux descriptions anciennes et constitue un type ou tout au moins un cotype de l'espèce. J'ai également mentionné certains exemplaires qui, sans être des types, appartiennent à des espèces rares ou intéressantes.

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* A Catalogue of Lucanoid Coleoptera, etc. etc., Trans. Ent. Soc. Lond., 1864.

Pour plus de simplicité j'ai suivi, dans ces notes, l'ordre approximatif de la classification adoptée par Parry, qui n'a d'ailleurs pas été modifiée sensiblement par les récents auteurs. Je me borne à mentionner les types revus en 1906, sur lesquels aucune observation ne me paraît utile à présenter, en indiquant par les lettres B. M. (British Museum) et U. O. (Université d'Oxford) les collections dans lesquels ils sont conservés.

Sphenognathus higginsi Parry, Ent. Monthl. Mag., 1876, p. 174. Le mâle de cette espèce est jusqu'à présent fort rare. Outre le type, qui fait partie de la collection de M. R. Oberthür, et un exemplaire de la collection Van de Poll, actuellement dans ma collection, je ne connais que le spécimen du British Museum. Ces trois insectes sont absolument différents du *S. garleppi* que j'ai décrit, et la synonymie qui figure fréquemment sur les catalogues des marchands allemands et dont je ne connais pas l'auteur, est erronée. *S. higginsi* est un insecte de plus petite taille que *S. garleppi*, ses mandibules sont plus rectilignes; les angles antérieurs et surtout les angles postérieurs du prothorax sont arrondis, la saillie humérale des élytres est coupée obliquement. Tous ces caractères n'existent pas chez *S. garleppi*.

Sphenognathus canaliculatus Parry, Trans. Ent. Soc. Lond., 1874, p. 368, pl. 4, fig. 2.—Le type, conservé au British Museum, ressemble beaucoup à un petit mâle de *S. feisthameli* Guérin; les angles antérieurs de la tête sont très aigus; la couleur est celle du *S. feisthameli*; la double épine des angles postérieurs du prothorax est peu développée. Pour affirmer la synonymie il serait nécessaire de comparer le type à plusieurs exemplaires de même développement du *S. feisthameli*, mais elle me paraît au moins vraisemblable.

Dendroblax earlei White, Voyage Ereb. and Terror, 1846, Ent., p. 9, pl. 2, figs. 9–10. Le type conservé au British Museum paraît être un mâle d'après ses antennes.

Rhyssonotus jugularis Westwood, Trans. Ent. Soc. Lond., 1863, p. 429, pl. 14, fig. 1. Le type, présumé être une femelle, mais qui me paraît plutôt être un mâle, est conservé au British Museum.

Lamprima schreibersi Hope in litt. L'insecte type est un mâle de taille moyenne de *L. aurata* Latr., de couleur verte, avec la tête vert doré un peu rougeâtre.

Lamprima coerulea Donovan, Ins. Nov. Holl., 1805, tab. 1. Il existe, au musée d'Oxford et au British Museum, quelques exemplaires d'une *Lamprima* d'un vert plus ou moins bleu, parfois bleu violacé, ayant la tête d'un vert bronzé, à peine un peu rougeâtre sur les carènes céphaliques, qui présentent, outre leur couleur spéciale, une légère modification de la forme habituelle des mandibules, surtout pour celle de gauche. L'extrémité des mandibules se trouve en effet plus ou moins nettement quadridentée au lieu d'être, comme d'ordinaire, tridentée, ce qui est réalisé par l'existence d'une petite dent supplémentaire placée entre la dent supérieure simple et la dent apicale bifurquée. Ces insectes paraissent être des *L. latreillei* M. L., faiblement modifiés et peuvent être considérés comme appartenant à une variété ou sous-variété de cette espèce. Je n'en ai vu des spécimens que dans des collections anciennes où ils sont en général étiquetés : "*Coerulea* Donovan." Leur provenance exacte m'est inconnue. Il y a huit spécimens à Oxford dont un beau mâle, très typique, venant de la collection Hope et deux autres grands exemplaires bien caractérisés, provenant de la collection Westwood. Trois autres sont au British Museum. (Pl. IX, fig. 5, *L. coerulea*, mandibules.)

Lamprima fulgida Dupont (type ou cotype ?). Sous le nom de *puncticollis* Hope, *fulgida*, Dupont, sont conservées à Oxford plusieurs femelles, dont l'une porte une étiquette visiblement très ancienne, sur laquelle se trouvent tracés, d'une écriture allongée, les mots : "*fulgida* mihi." C'est une *L. aurata* Latr.

Lamprima puncticollis Dejean, Hope in litt. Le spécimen qui porte la mention : "*puncticollis* Dej." est également une *L. aurata* Latr. (U. O.).

Lamprima insularis Hope in litt. Le spécimen de Hope est un mâle de *L. micardi* Reiche, assez grand exemplaire de couleur bronzée, à pointe sternale assez forte. (U. O.)

Lamprima purpurascens Hope, type, Cat., p. 28. L'insecte ainsi désigné est également un mâle de *L. micardi* Reiche, assez grand, de couleur bronzée rosâtre (U. O.). Espèce omise par Parry dans son Catalogue.

Lamprima tasmaniae Hope, type, Cat., p. 27. Le type paraît être un petit exemplaire, vert foncé, à courtes mandibules, de *L. latreillei* MacLeay. Cette synonymie a été indiquée par Parry (Cat. 1864, p. 69). (U. O.)

Lamprima subrugosa Hope, type, Cat., p. 28. Le type est un mâle moyen de *L. aenea* Fabr., comme l'a indiqué Parry (Cat. 1864, p. 70). (U. O.)

Lamprima sumptuosa Hope, type, Cat., p. 28. Le type est un petit spécimen, assez étroit, parallèle, de couleur dorée cuivreuse, de *L. micardi* Reiche. Parry a considéré dans son premier Catalogue (Cat. 1864, p. 7 et p. 70) cette espèce comme distincte, mais elle ne se sépare de *L. micardi* par aucun caractère valable (U. O.).

Lamprima nigricollis Hope, type, Cat., p. 28. Cette espèce n'a pas été mentionnée par Parry dans son Catalogue de 1864. Le type conservé à Oxford est une femelle d'un noir glacé bleu, avec la tête vert doré nuancée de rouge cuivre. Les pattes sont presque noires. La saillie du prosternum est presque nulle. L'insecte porte une étiquette : "*Nigricollis* Hope, *micardi* teste Parry," qui prouve que cette *Lamprima*, quoique non inscrite au Catalogue de 1864, a été examinée par Parry. Je rapporte également ce spécimen à *L. micardi* Reiche.

Streptocerus speciosus Fairmaire, Ann. Soc. Ent. Fr., 1850, p. 53. La femelle, figurée par Westwood (Tr. Ent. Soc., ser. 2, vol. iii., 1853–56, p. 204, pl. xi., figs. 1, 1*a*, 1*b*, 1*c*, 1*d*), est conservée à Oxford.

Colophon thunbergi Westwood, Trans. Ent. Soc. Lond., 1855, p. 198, pl. 10, fig. 2 type. L'exemplaire, conservé à Oxford, correspond bien à la figure donnée par Westwood, mais les étiquettes sont récentes. Le type du *C. westwoodi* Gray, figure également dans la collection. L'examen de ces spécimens est d'autant plus intéressant que M. Péringuey a cru devoir mettre en doute la validité de l'espèce et a affirmé, un peu légèrement, que le *C. thunbergi* était simplement la femelle du *C. westwoodi*. Je ne sais sur quels documents est basée la conviction de M. Péringuey, mais il me paraît certain qu'elle n'est pas exacte. Le *C. thunberbi* du Musée d'Oxford est un spécimen dont les parties génitales et la mâchoire de gauche ont été disséquées. Ces mêmes organes se retrouvent sur un carton où se trouve la mention: "Genitalia et max. *Colophon buffonii*, Wd." Ce dernier nom était probablement celui que Westwood s'était d'abord proposé de donner à l'espèce. Les organes génitaux sont ceux d'un mâle. *C. thunbergi* doit donc être considéré comme distinct de *C. westwoodi*.

Il est à noter d'ailleurs que Westwood a formellement affirmé que le type du *C. thunbergi* était un mâle et non comme on pourrait le supposer, l'autre sexe du *C. westwoodi*.

Colophon westwoodi Gray, in Griff. Anim. Kingd., 1832, p. 534., pl. 46, fig. 5, type. L'insecte porte deux étiquettes anciennes : "*Colophon lethroides* Hope, *westwoodi* G." avec l'indication ajoutée au crayon "♂" et "*Colophon westwoodi*, Gray in Griff., Westw. in Ann. Sc. Nat." Sur un carton se trouvent l'organe génital, qui est celui d'un mâle, et le dernier segment abdominal, côté dorsal. Ce carton porte : " Genitalia *Colophonis westwoodi*." Le spécimen, conservé au British Museum, est également un mâle. D'après ce qui précède, les hypothèses de M. Péringuey doivent être rejetées.

Phalacrognathus westwoodi Shipp., Trans. Ent. Soc. Lond., 1893, p. 223. Le type est un mâle de *Ph. muelleri* M. L., appartenant à la forme majeure, mais non au maximum de son développement.

Pseudolucanus atratus Hope, in Gray, Zool. Miscell., 1831, p. 22, Cat., p. 10. Le type est un mâle de faible développement, à mandibules simples, provenant du Nepaul (U. O.).

Lucanus lusitanicus Hope, type, Cat., p. 9. C'est un mâle de très grande taille, de la forme un peu spéciale, allongée et élégante, qui se trouve dans la péninsule et se rencontre déjà dans les Pyrénées. Cette race ressemble à celle de Syrie, mais les antennes ne diffèrent pas de celles du *L. cervus* ordinaire.

Lucanus lunifer Hope, in Royle Ill. Nat. Hist. Hymal. Ins., 1833, p. 55, pl. 9, fig. 4, Cat. p. 9. Le mâle type est de grande taille, la fourche des mandibules est pointue et ne présente pas l'élargissement apical que l'on remarque sur certains exemplaires. La femelle type, *L. rugifrons* Hope, est petite, elle se rapporte bien à cette espèce (U. O.).

Lucanus cantori Hope, Proc. Ent. Soc. Lond., 1842, p. 83, types. Le mâle est un exemplaire moyen, la femelle type existe également dans la collection (U. O.).

Lucanus villosus Hope, in Gray, Zool. Miscell., 1831, p. 22. Un mâle de cette rare espèce existe au British Museum, il n'est pas impossible que ce soit le type de Hope. D'après le Catalogue Hope, p. 4, le *L. villosus* n'existait pas dans la collection Hope. Je ne l'ai pas retrouvé à Oxford. L'espèce était représentée dans la collection Parry par un couple, actuellement conservé dans la collection de M. R. Oberthür, mais ce couple, d'après le Catalogue dressé au moment de la vente de la collection Parry, ne comprenait pas de type.

L'insecte du British Museum, très voisin du *L. lunifer* par les mandibules, se rapproche également beaucoup de cette espèce par la tête, le thorax et les pattes.

Lucanus mearesi Hope, Proc. Ent. Soc. Lond., 1842, p. 83, Cat., p. 10. Le type est un grand mâle dont la fourche mandibulaire ne présente pas d'élargissement sur la dent apicale (U. O.).

Lucanus nigripes Hope, Cat., p. 10. Parry a signalé (Cat., 1864, p. 72) que cet insecte était la femelle du précédent, ce qui avait déjà été indiqué comme possible dans la diagnose originale. Le spécimen étiqueté comme type est une femelle de taille médiocre, sans étiquette ancienne. Cet insecte doit bien être rapporté au *L. mearesi*. Une autre femelle, de plus grande taille, qui porte l'étiquette ancienne : " Mearse, India," appartient également à cette espèce. L'attribution du type à l'une ou à l'autre des deux femelles peut être douteuse, mais la synonymie demeure, de toute façon, correcte (U. O.).

Lucanus westermanni Hope, Cat., p. 10. Le type est un mâle moyen, ne présentant aucune particularité (U. O.).

Lucanus vicinus Hope, Cat., p. 10. Cette espèce est une de celles qui ont donné lieu à des discussions. Elle a été admise par Parry (Cat. 1864, p. 73), et ce spécialiste possédait un spécimen passé ensuite dans la collection Barton et actuellement conservé dans ma propre collection, qu'il considérait comme un *L. vicinus*. Cet exemplaire porte, de la main de Parry, une étiquette ainsi libellée : " *L. vicinus*, Hope, from his coll. Ind. O. Burm., says good sp. from Poonah but ? a sp. very close to *cervus*." L'insecte présente tous les caractères d'un *L. cervus* de forme mineure, légèrement déformé par un accident, aussi la synonymie : *L. vicinus* Hope = *L. smithi* Parry, donnée par M. Planet dans sa monographie* (vol. ii, p. 63) d'après l'examen du type du *L. vicinus* par M. R. Oberthür, m'avait toujours semblée fort douteuse. La diagnose du Catalogue Hope dit en effet expressément que le type ressemble à un *L. cervus* de petite taille et appartient peut-être à une simple variété géographique. L'examen fait par M. R. Oberthür a dû être des plus superficiels, ou aura porté sur un autre exemplaire que le type, car, après avoir étudié ce spécimen, je ne puis lui trouver aucune parenté avec *L. smithi.* Il ressemble au contraire beaucoup à l'exemplaire de Parry que j'avais emporté à Oxford, mais est plus grand et sans défectuosité. Il n'y a pour moi aucun doute sur l'attribution de ces insectes, qui sont des *L. cervus* de forme mineure. Quant à leur provenance, l'hypothèse la plus vraisemblable est que ces deux seuls spécimens connus du *L. vicinus* sont des *L. cervus* européens, emportés ou envoyés aux Indes et qui auront été réexpédiés sans indication de provenance, soit volontairement, soit par erreur. Des confusions de ce genre se sont produites plusieurs fois et se produisent encore assez fréquemment; j'ai reçu, pour ma part, un *Dorcus parallelipipedus* de Sumatra et des *Figulus* de l'Amérique du Sud, sans parler des erreurs nombreuses de provenance que l'on trouve dans toutes les anciennes collections.

Lucanus americanus Hope, Cat., p. 10. Cet insecte a été considéré par Parry comme synonyme du *L. cervus.* Le type est d'un aspect très singulier. C'est évidemment un insecte immature. Les élytres sont presque complètement décolorées et les tarses sont jaunes. La forme elle-même est assez spéciale. L'insecte paraît être un *L. cervus* mineur, mais très fort pour son développement mandibulaire, et beaucoup plus massif que cela n'est habituel pour ceux de ces insectes qui proviennent de l'Europe occidentale. J'ai reçu récemment un lucane de cette forme, mais plus petit, provenant de Sarepta (Russie Méridionale) et, dans l'état actuel de nos connaissances, on peut admettre que c'est à une race locale analogue qu'appartient le *L. americanus* Hope.

Je dois cependant dire que, d'après des spécimens femelles qui se trouvent dans plusieurs collections, il semblerait exister, dans l'Amérique du Nord, un *Lucanus* plus grand que le *L. elaphus*. Mais ces femelles, dont il existe deux exemplaires au British Museum, sont très distinctes de celles du *L. cervus* et il paraît bien peu vraisemblable que leurs mâles se rapportent au *L. americanus* Hope.

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* "Généralement désigné dans les collections sous le nom de *Smithii* que lui a donné Parry, ce Lucane n'est autre que la *Luc. vicinus,* ainsi que M. R. Oberthür a pu le constater l'année dernière à Oxford, en examinant la collection de Hope." Planet, *loc. cit.*

Lucanus laminifer Waterhouse, Ann. Mag. Nat. Hist., 1890, p. 33. Les types existent au British Museum; ils comprenaient un mâle d'une espèce distincte, que j'ai séparé et décrit sous le nom de *L. dohertyi*.

Lucanus swinhoei Parry, Trans. Ent. Soc. Lond., 1874, p. 370, pl. 4, fig. 4. Les types, mâle et femelle, sont au British Museum.

Lucanus sp. ? Planet, Essai Monographique, vol. ii, p. 124, fig. 75. M. Planet a figuré (*loc. cit.*) d'après un croquis de l'album de Parry conservé chez M. R. Oberthür, un singulier mâle de *Lucanus* provenant du Liban, et l'a rapproché, avec quelque doute, du *Lucanus* qu'il a décrit, dans le même travail, sous le nom de *L. cervus*, var. *akbesiana* Planet, Essai Monogr. vol. i, p. 62. Pl. 14, fig. 2. J'ai retrouvé cet exemplaire dans la collection du British Museum. Il porte les étiquettes anciennes: "*Macrophyllus ?* Reiche, Syria, Lebanon, *n. sp.* Dr. Meryon."

L'insecte est un spécimen défectueux. Les deux mandibules ont été arrachées et mal rentrées dans leurs alvéoles, ce qui leur donne l'aspect falciforme reproduit par le croquis de Parry. En examinant l'insecte, on voit extérieurement, à la base de la mandibule, l'apophyse sortie de son logement. La tête et le corps sont ceux d'un *L. ibericus* Motsch. (*orientalis* Kraatz) assez fort et assez plat. [Pl. IX, fig. 14].

Rhaetus westwoodi Parry, Proc. Ent. Soc. Lond., 1862, p. 108, type mâle, conservé au British Museum.

Hexarthrius longipennis Hope, Cat., pp. 10, 11. Cet insecte est indiqué, dans la diagnose, comme provenant de Java et de l'Assam et comme pouvant être la femelle de l'*Hexarthrius rhinoceros* Ol. Parry, (Cat. 1864, p. 74) a admis cette hypothèse et, dans la collection d'Oxford, le type a été réuni aux spécimens de *H. rhinoceros*. Les étiquettes que porte cet insecte sont: 1° "Java." 2° "*longipennis* Hope." 3° "*longipennis* Hope Assam." La provenance Assam doit être considérée comme erronée. L'insecte, étroit avec des élytres longues, une tête très bombée et des canthus oculaires arrondis extérieurement, me paraît être une femelle de l'*Hexarthrius buqueti* Hope. *Hexarthrius rhinoceros* Ol. est rarement reçu de Java et, de plus, la structure de *H. rhinoceros* femelle est plus courte et plus robuste que celle du type de *H. longipennis*.

Hexarthrius falciger Hope, Cat., p. 11. Cet insecte a également été réuni à *H. rhinoceros* Ol. par Parry (Cat., 1864, p. 74) comme appartenant à la forme mineure de cette espèce. Le type provient de Java et porte les mêmes étiquettes de provenance que le spécimen type de *H. longipennis*, toutefois au lieu d'"Assam" la troisième étiquette indique "Java." L'insecte est de très faible développement et difficile à déterminer à vue, il me paraît cependant être un *H. buqueti* Hope (U. O.).

Hexarthrius forsteri Hope, Trans. Linn. Soc. Lond., 1841, p. 587, pl. 40, fig. 1, Cat., p. 11. Cette espèce est représentée par trois spécimens anciens. Des deux plus grands, qui portent l'étiquette "*Calanus*, Hope," le second pour la taille correspond très bien avec la figure donnée par le descripteur (Linn. Trans. 18, 588, tab. 40, fig. 1). Le plus petit porte l'étiquette "*Cantori* Hope." (U. O.) *Hexarthrius serricollis* Hope, Cat., p. 11, est bien, comme l'a indiqué Parry (Cat. 1864, p. 74), la femelle de *H. forsteri* (U. O.).

Hexarthrius davisoni Waterhouse, Ann. Mag. Nat. Hist., 1888, p. 250. Cette espèce, dont les types sont conservés au British Museum, a bien pour synonymes *H. cotesi* Nonfried et *H. castetsi* Boileau.

Cladognathus confucius Hope, Proc. Ent. Soc. Lond., 1842, p. 60, Cat., p. 18. J'espérais trouver dans les collections de l'Université d'Oxford le type de Hope, mais je l'ai cherché inutilement. Par contre, les exemplaires indiqués par la diagnose comme se rapportant à cette espèce et autrefois nommés *L. whithillii* Hope existent dans la collection; mais ce sont sans aucun doute des *C. giraffa* Fabr. ainsi que l'a indiqué Parry.

Les deux plus grands exemplaires mesurent l'un 34 lignes, l'autre 31. Le premier porte les indications : "Withill, Bombay" et "*Confucius* var. *Withillii* Hope," le second : "*Withillii* Hope" et "Khasyah Hills." Deux autres mesurent 26½ et 25 lignes, et ont simplement les étiquettes de provenance : "Poona" pour le premier, "Bombay" pour le deuxième. Ils représentent probablement le *C. brahminus* Hope.

Le *C. confucius* type est indiqué comme ayant eu 28 lignes; il ne correspond donc à aucun de ces spécimens; on voit d'ailleurs qu'il s'agit d'un petit exemplaire. Le provenance " Chusan " me porte à croire que le type doit bien être un *C. confucius* tel que nous le comprenons maintenant; la confusion faite par Hope (ou Westwood) entre les deux espèces voisines s'explique par le faible développement du type du *C. confucius.*

C. downesi Hope, Cat. p. 19, type, existe dans la collection d'Oxford; c'est une femelle courte et large, dont l'étiquette de provenance est Bombay; on doit la considérer comme étant une femelle de *C. giraffa* Fabr.

Psalidoremus motschulskyi Waterhouse, Trans. Ent. Soc. Lond., 1869, p. 16. Le type de cette espèce est conservé au British Museum. Dans la description, la provenance est indiquée " Japon ou Archipel Indien." Je possède, de cette espèce, deux exemplaires qui se trouvaient dans la collection Barton et venaient de la collection Parry, comme aussi le type de la description. Tous deux sont de la forme mineure mais se rapportent bien au *P. motschulskyi* et ont été déterminés comme tels par Parry. Le plus grand porte l'indication : " I. Formose," l'autre : " Coll. Saunders Formosa." La provenance Formose me paraît donc certaine; elle est d'ailleurs tout à fait vraisemblable [Pl. IX, fig. 13].

Metopodontus downesi Hope, Trans. Zool. Soc. Lond., 1835, p. 99, pl. 13, fig. 7, Cat., p. 11. Très exactement représenté par la figure donnée par le descripteur (Zool. Trans. i, p. 99, pl. 13, fig. 7), le type est conservé à Oxford.

Metopodontus savagei Hope, Ann. Mag. Nat. Hist., 1842, p. 494, Cat., pp. 11, 12. Deux mâles et une femelle sont indiqués comme étant les types. La femelle seule porte une indication un peu précise de localité: " Palmas."

Metopodontus ungulatus Hope, Ann. Mag. Nat. Hist., 1842, p. 494, Cat., p. 12. Le type, conservé comme les précédents à Oxford, est, comme l'a indiqué Parry (Cat. 1864, p. 82) un *M. savagei* de forme mineure. Ses mandibules sont inermes.

Metopodontus castaneus, Hope, Cat., p. 12. Cette espèce a toujours été considérée comme valable. L'insecte indiqué comme type dans la collection d'Oxford mesure exactement les 24 lignes indiquées par la description. Il porte deux étiquettes anciennes: " *Castanea*," " *Castaneus* Sn. P. Walker." Les mandibules sont celles d'un exemplaire appartenant à la forme moyenne des *Metopodontus* de cette section (*Metopodontus* vrais); elles présentent une dent basale trituberculée, aucune dent médiane, et trois denticules anté-apicaux. Par la forme générale, la coloration, surtout celle des pattes et des élytres, et par l'angle médian du prothorax cet insecte se rattache, sans aucun doute possible, au *M. cinnamomeus* Guérin, de Java. Le *M. castaneus*, Hope, doit donc passer en synonymie. Comme je l'indique plus loin les espèces que l'on reçoit habituellement de l'Inde et que l'on désigne dans les collections sous le nom de *M. castaneus* sont, en réalité, des *M. foveatus* Hope, ou des *M. poultoni* Boileau.

Metopodontus omissus Hope, Trans. Linn. Soc., 1842, p. 591, Cat., p. 12. Ainsi que l'a indiqué Parry (Cat. 1864, p. 79) le type est un *M. foveatus* Hope. L'exemplaire étiqueté comme type appartient à la forme moyenne. Les mandibules, dépourvues de dent médiane, ont une double dent basale. Il existe un autre exemplaire, qui semble ancien; un peu moins développé, contrairement à l'indication donnée par Parry (*loc. cit.*) et conformément à la diagnose.

Metopodontus foveatus Hope, Trans. Linn. Soc., 1842, p. 590, Cat., p. 12. Comme je viens de l'indiquer, c'est le *M. castaneus* Hope de la plupart des collections. Le nom de *M. foveatus* est seul valable, la description du *M. omissus* suivant celle du *M. foveatus* et étant relative à un plus petit exemplaire de la même espèce. Le type est un mâle intermédiaire entre la forme moyenne et la forme majeure. Les mandibules ont une dent médiane simple, à gauche, mais celle-ci est seulement aux deux cinquièmes de la longueur à partir de la base. A droite, la dent est bifide. L'insecte vient de Sylhet. L'indication "Java" qui suit la provenance correcte "Assam" dans le Catalogue, vient évidemment d'une confusion avec d'autres exemplaires appartenant au *M. cinnamomeus* Guérin, qui auront sans doute été vus par Hope ou Westwood dans d'autres collections.

Metopodontus astacoides Hope, Trans. Linn. Soc. 1842, p. 590, Cat., p. 12. Parry a déjà indiqué que cet insecte était un *M. foveatus* minor (Cat. 1864, p. 79). Le type est un exemplaire à mandibules entièrement denticulées.

Metopodontus fraternus Hope, Cat., pp. 12 13. La même synonymie correcte a été donnée par Parry (*loc. cit*). Le type ne diffère du précédent que par ses mandibules incomplètement denticulées; il appartient à un développement plus fort.

Metopodontus (*Hoplitocranum*) *macclellandi* Hope, Proc. Ent. Soc. Lond., 1842, p. 83, Cat., p. 13. Le type est un petit exemplaire à mandibules entièrement denticulées. Les pattes postérieures ne portent pas les pinceaux soyeux de l'espèce voisine, généralement connue sous le nom de *M. calcaratus* Jakowleff et que je considère comme étant en réalité le *M. jenkinsi* Westwood.

Metopodontus fulvipes Hope, Cat., p. 13. La synonymie donnée par Parry (Cat., 1864, p. 79) : *fulvipes* = *cinnamomeus* var. min. est exacte. Le type est un mâle de très petite dimension du *M. cinnamomeus.* Il porte l'étiquette : "*fulvipes*" au verso de laquelle se trouve l'indication "*rafflesii* Hope," qui a été barrée. Le *M. rafflesii* Hope (Proc. Ent. Soc. Lond., 1844, p. 106), est, suivant Parry, (Cat. 1864, p. 79) la femelle du *M. cinnamomeus ;* je n'ai pas retrouvé ce type à Oxford, par contre celui du *M. pallidipennis* Hope (Trans. Linn. Soc., 1842, p. 590) s'y trouve conservé; c'est un grand mâle du *M. cinnamomeus,* dont la seule particularité à signaler est l'existence d'une dent médiane double à la mandibule de droite. Il résulte de ce qui précède que le *M. cinnamomeus* Guérin a été décrit quatre fois par Hope et Westwood sous les noms de *pallidipennis*, *castaneus*, *fulvipes* et *rafflesii.*

Metopodontus impressus Waterhouse, Trans. Ent. Soc. Lond., 1864, p. 17, types conservés au British Museum. Cette espèce est intéressante, peu connue; sa provenance exacte est ignorée. Elle se rapproche des espèces pour lesquelles Jakowleff avait créé le sous-genre *Hoplitocranum :* les femelles, en particulier, sont fortement ponctuées et rappellent celles de ce groupe, dont elles ont à peu près la taille. Je ne considère pas comme absolument certain que le plus grand mâle appartienne à la même espèce que les autres.

Metopodontus limbatus Waterhouse, Ann. Mag. Nat. Hist., ser. 5, xix, p. 381, types mâle et femelle, British Museum. Cette espèce est tantôt considérée comme distincte, tantôt comme synonyme de *M. cinctus* Montrouzier. En général les exemplaires que l'on rapporte au *M. limbatus* forment passage entre le *M. cinctus* et le *M. torresensis ;* ils sont assez allongés, un peu cylindriques, avec une large bordure jaune aux élytres et semblent former une sous-variété ou une race locale. Dans le collection du British Museum, il y a bien, sous la désignation *cinctus*, quelques spécimens de cette forme, provenant des Iles Murray, Cornwallis et du Cap York. Mais les véritables types viennent des Iles Thursday et ne me paraissent pas différer des *M. cinctus* de Nouvelle Guinée et des îles voisines. Le *M. cinctus* lui-même peut difficilement être séparé du *M. bison*, qui varie suivant les provenances et dont il constitue une variété.

Metopodontus roepstorffi Waterhouse, Ann. Mag. Nat. Hist., ser. 6, v, p. 35, dont les types sont également au British Museum, ne peut guère être considéré que comme une variété du *M. occipitalis* Hope, dont la répartition géographique est fort étendue et qui varie sensiblement suivant les provenances. Les marques noires de la femelle, plus fortes que d'habitude, n'ont pas grande importance; on retrouve d'ailleurs sur des femelles du *M. occipitalis* de diverses localités la forte macule élytrale portée par les femelles du *M. roepstorffi.*

Metopodontus occipitalis Hope, Cat., p. 13. Le type mâle est un spécimen de forme moyenne, à mandibules symétriques; la femelle, brillante, présente une suture élytrale et des macules thoraciques très nettes; les macules céphaliques sont peu développées. Ces insectes n'ont conservé aucune étiquette d'origine, mais la diagnose indique qu'ils proviennent des Philippines, ce qui concorde bien avec leur structure.

Metopodontus inquinatus Westwood, Cab. Or. Ent., p. 18, pl. 8., fig. 4. Je pense que le couple conservé au British Museum est formé par les deux types. Cet insecte est resté très rare dans les collections; il est étroitement apparenté au *M. biplagiatus* Westwood. Comme dans cette espèce, mais d'une manière moins nette, le mâle du *M. inquinatus* porte trois carènes sur la face inférieure des joues.

Prosopocoelus cavifrons Hope, Cat., p. 13. Le type est un spécimen de forme majeure (U. O.).

Prosopocoelus lateralis Hope, Cat., p. 13. Il existe deux types mâles, le premier est un exemplaire de forme majeure, dont les mandibules sont dépourvues de dent médiane, le second appartient à la forme mineure. La femelle type est également conservée à Oxford. Quelques spécimens de la collection portent le nom *exaratus* Dejean.

Prosopocoelus quadridens Hope, Cat., p. 14. Cette espèce, et les quatre suivantes, sont restées très douteuses et l'examen que j'en ai fait ne m'a pas permis de déterminer aussi exactement que je l'aurais désiré, leur synonymie véritable. La question se complique du fait que l'attribution réelle du *P. antilopus*, Swederus, est également restée problématique. Enfin il semble que les *Prosopocoelus* africains de ce groupe soient à la fois très proches et assez variables, ce qui rend encore plus difficile leur délimitation et leur synonymie.

Le *P. quadridens* type [Pl. IX, Fig. 8. mandibule] est un insecte d'un roux obscur, plus foncé sur la tête et le thorax. Les mandibules, la tête, le pronotum, sont finement et régulièrement granuleux; les élytres sont dépolies, avec la région suturale noircie et assez brillante; il existe de faibles traces de côtes. L'exemplaire est un mâle de forme majeure, dont les mandibules, légèrement élargies à la base, inermes sur la plus grande partie de leur longueur, portent chacune deux dents antéapicales, dont la plus voisine de l'apex est la plus forte. Ce sont donc les deux mandibules considérées ensemble qui portent quatre dents. Cet insecte est étiqueté comme venant de Sierra Leone. Un autre, presque pareil, est indiqué de " Cape Palmas." Ces deux exemplaires sont conservés au Musée d'Oxford. Je possède des spécimens tout à fait analogues venant de Sierra Leone, d'Assinie, du Dahomey, et même du Congo; je considère également que le *Prosopocoelus* que l'on reçoit du Cameroun, et qui est de couleur un peu plus claire, ne diffère pas de cette espèce, c'est, je pense, cette variété qui a été décrite par M. Kolbe sous le nom de *P. camarunus* (Ent. Nachr., 1897, p. 12).

Tous ces insectes, et spécialement certains spécimens du Cameroun, semblent devoir être rapportés au *P. antilopus* Swederus, quoique la description et le dessin ne permettent pas une affirmation absolue sur ce point. De toute façon, il est certain que le *P. quadridens* est identique au suivant :

Prosopocoelus sayersi Hope, Cat., p. 14. Le type [Pl. IX, fig. 9, mandibule], qui est également un mâle de grand développement, a une dent de plus aux mandibules et l'extrémité fourchue de celles-ci est un peu plus plate. La dent supplémentaire, qui est assez faible, est voisine du milieu, et se trouve implantée dans le plan de la face inférieure de la mandibule qui est, comme chez *quadridens*, de section plutôt carrée qu'arrondie. Or si l'on regarde bien les mandibules du *quadridens*, on voit qu'il existe une faible carène formant un rudiment de denticule au dessous de la première dent et un peu plus près de celle-ci que chez le *P. sayersi*. Sauf des différences insignifiantes, les deux spécimens sont identiques comme forme et couleur et le nom de *sayersi* doit, de toute façon, ainsi que l'avait déjà indiqué Parry (Cat. 1864, p. 83) être considéré comme un simple synonyme de *quadridens*.

Prosopocoelus speculifer Hope, Cat., p. 14. Le mâle et la femelle, qui sont les types de Hope, sont des spécimens de petite taille. La couleur est sombre, avec la région suturale rembrunie et noirâtre. Les joues sont creuses, la saillie de l'épistome est simple. Cette espèce, qui est certainement identique à la suivante, *P. piceipennis* Hope, décrite antérieurement, me paraît pouvoir être également assimilée au *P. camarunus* Kolbe qui n'en diffère guère que par une coloration plus claire. Les types du *P. speculifer* sont de Cape Palmas.

Prosopocoelus piceipennis Hope, Cat., p. 14. Le type est un insecte de forme élégante et de couleur sombre, appartenant à un développement moyen. Les mandibules sont relativement assez grêles. Les bords du pronotum ne sont pas droits, mais légèrement concaves avant l'angle médian. La tête et le prothorax sont granuleux. La provenance, d'après l'étiquette ancienne, est Sierra Leone. Parry a admis que les *P. piceipennis* et *speculifer* représentaient respectivement la forme moyenne et la forme mineure du *P. quadridens*. S'il en est bien ainsi, comme je suis aussi disposé à le croire, le nom de *piceipennis* aurait la priorité sur les autres, mais ne serait valable que si la description du *P. antilopus* Swed. devait être rapportée à une autre espèce, ce qui semble vraiment peu probable.

En résumé, dans l'état actuel de nos connaissances, on peut considérer les *P. piceipennis*, *quadridens*, *sayersi* et *speculifer* Hope, ainsi que le *P. camarunus* Kolbe, comme synonymes du *P. antilopus* Swederus.

Prosopocoelus martini Hope, Cat., p. 14. Parry a admis (Cat., 1864, p. 82) que cet insecte représentait une forme du *P. senegalensis* Klug. L'insecte conservé à Oxford diffère certainement du *P. piceipennis*; il est encore plus foncé comme couleur, la suture élytrale est largement teintée de noir. Les canthus oculaires sont droits; les côtés du prothorax sont concaves derrière l'angle médian. Les tibias postérieurs sont inermes, comme l'indique la diagnose, mais portent un renflement indiquant que des exemplaires plus petits et les femelles ont une épine à cette paire de pattes comme à la précédente. L'épistome forme une saillie simple, peu prononcée. Tous ces caractères se retrouvent chez le *P. senegalensis* et la synonymie donnée par Parry me semble exacte.

Prosopocoelus hanningtoni Waterhouse, Ann. Mag. Nat. Hist., 1890, p. 34. Cette espèce, dont les types sont au British Museum, se rattache au groupe du *P. serricornis* Latr.; elle ne diffère que par des caractères sans importance de l'espèce, largement répandue dans l'Afrique orientale allemande, qui a été ensuite décrite par M. Nonfried sous le nom de *P. brunneus* (Ent. Nachr., 1892), et que ce dernier considérait comme une variété du *P. serricornis* Latr. de Madagascar.

Prosopocoelus oweni Hope, Cat., pp. 14, 15. Le type est un petit mâle. Les mandibules présentent chacune un tubercule inférieur, plus développé à droite, mais bien distinct aussi à gauche. Il se rapporte bien aux spécimens ordinairement déterminés comme *P. oweni* dans les collections.

Prosopocoelus subangulatus, Hope, Cat., p. 24. Cet insecte est conservé à Oxford, comme le précédent. Ainsi que l'a indiqué Parry (Cat. 1864, p. 82), c'est la femelle du *P. oweni*.

Prosopocoelus bulbosus Hope, Trans. Linn. Soc., xviii, p. 589, tab. xi, fig. 2, nec. *P. bulbosus* Hope, Cat., p. 20. Parry a signalé (A Revised Catalogue of the Lucanoid Col. etc. Trans. Ent. Soc. Lond., 1870, p. 84) que le *P. bulbosus* Hope, Cat., p., 20, était un autre insecte que le *P. bulbosus* Hope antérieurement décrit dans les Trans. Linn. Soc. Le vrai *P. bulbosus*, tel qu'il a été figuré (*loc. cit.*) a la saillie de l'épistome simple et le *P. bulbosus* du Catalogue a cette saillie bituberculée. Je reviendrai, en parlant du *P. spencei* Hope, sur les conclusions que Parry a cru devoir tirer de cette constatation.

Le *P. bulbosus* type, conservé à Oxford, est certainement celui qui a été décrit dans les Trans. Linn. Soc., 1841, p. 589. Il est bien conforme au dessin donné dans cette publication (tab. xi, fig. 2). La saillie de l'épistome est simple.

Par contre, je n'ai pas vu les spécimens ayant servi de base à la description du Catalogue, mais il est très possible qu'ils existent dans la collection d'Oxford, mon attention ne s'étant pas portée sur l'intérêt que présentait, en réalité, leur recherche.

Prosopocoelus punctiger Hope, Cat., p. 24. C'est une femelle, qui appartient certainement à ce groupe. Il serait nécessaire de l'examiner avec beaucoup de soin pour pourvoir la rapporter à l'une ou l'autre des espèces connues et la synonymie (= *spencei* ♀) donnée par Parry (Trans. Ent. Soc. Lond., 1870, p. 85), est basée sur l'hypothèse incorrecte de l'identité du *P. bulbosus* Hope (Trans. Linn. Soc.) et du *P. spencei.*

Prosopocoelus spencei Hope, Cat., p. 19. Cette espèce qui a été décrite par Hope (Trans. Linn. Soc., xviii, p. 589) d'après un mâle unique de développement maximum, de la collection Cantor, est en réalité peu connue et a donné lieu à des discussions anciennes, ainsi qu'à des confusions nombreuses. L'étude du type, conservé à Oxford, est donc particulièrement intéressante.

Dans son premier Catalogue (1864, p. 37) Parry a exposé les motifs pour lesquels il croyait devoir considérer *P. spencei* comme étant la forme maxima, très rare, du *P. bulbosus ;* malgré l'aspect très différent des mandibules, il avait aisément reconnu la parenté des deux insectes.

Ultérieurement, dans son deuxième Catalogue (1870, p. 84), comme je l'ai dit plus haut. Parry a signalé qu'il y avait, en réalité, deux *P. bulbosus* distincts, l'un décrit par Hope dans les Trans. Linn. Soc. en 1841 en même temps que le *P. spencei,* l'autre décrit dans le Catalogue des Lucanides de la collection Hope en 1845. Les deux espèces diffèrent par la saillie de l'épistome, qui est simple chez le premier et bituberculée chez le second; de plus on peut remarquer que la taille indiquée pour les deux spécimens types n'est pas exactement la même : unc. 1, lin. 6 pour le premier, lin. 17 pour le second. Dans son travail, Parry a admis à nouveau l'identité spécifique du *P. bulbosus* décrit en 1841 et du *P. spencei ;* il a considéré, de plus, que la *P. crenicollis* Thomson, Ann. Soc. Ent. Trans., 1862, p. 418, était également assimilable au *P. spencei ;* enfin il a laissé le nom de *P. bulbosus* à l'espèce décrite dans le Catalogue Hope de 1845.

Plus tard encore, Parry semble avoir eu quelques doutes sur l'identification du *P. crenicollis* Thomson, puisque dans son troisième Catalogue, publié en 1875, le *P. crenicollis* est rétabli au nombre des espèces distinctes et signalé, en même temps comme manquant à sa collection; cette espèce n'est d'ailleurs pas indiquée dans le Catalogue de la vente de la collection en 1885. Il me paraît probable que, dans l'intervalle écoulé entre la publication de son deuxième et de son troisième Catalogue, Parry aura eu l'occasion de voir en nature le *P. crenicollis* et qu'il aura reconnu qu'il différait notablement du *P. bulbosus* Hope (Trans. Linn. Soc.) qu'il considérait toujours comme étant la forme mineure du *P. spencei*.

Le fait que Parry n'a pas eu à sa disposition un spécimen du *P. crenicollis* et n'a pu, par suite, le comparer au type resté unique du *P. spencei* explique bien qu'il ait persisté à identifier le *P. bulbosus* à cette dernière espèce. La grande forme des deux *P. bulbosus* n'a d'ailleurs été reçue qu'une dizaine d'années plus tard. Si, à ce moment, la synonymie véritable n'a pu être établie, malgré le bon dessin du *P. spencei* donné par Parry (Cat., 1870, pl. 2. fig. 1), cela tient à ce que ce dessin laisse un petit doute sur la position et la grandeur de la dent médiane. On peut en effet supposer qu'il existe une dent supérieure dressée, dont les contours auraient été faiblement indiqués, analogue à celle des exemplaires de la forme maxima des *P. bulbosus*. La description est d'ailleurs encore moins explicite que le dessin sur ce point particulier.

En réalité, il n'y a aucune dent supérieure [Pl. IX, fig. 6 *a*, *b*, *c*, mandibule ; *d* menton], et la petite dent que l'on voit sur le dessin de Parry et qu'on pourrait prendre pour la projection de l'extrémité de la dent supérieure, est un denticule placé sur la carène interne inférieure. Cette disposition est absolument différente de ce qui existe chez *P. bulbosus* et suffit à séparer immédiatement les mâles de développement majeur. Un autre caractère réside dans la forme de la carène suturale du menton, qui est simple chez *P. spencei* et trilobée chez les deux *P. bulbosus* ; ce caractère est d'autant plus marqué que le développement est plus grand, les mâles de la forme mineure proprement dite ont la carène suturale simple pour les trois espèces. Enfin les canthus oculaires du *P. spencei* sont plus élargis en arrière que ceux des deux *P. bulbosus*, les crénelures thoraciques sont plus marquées et la forme est plus élégante.

Il faut conclure de ces différences que *P. spencei* n'est pas la forme majeure de *P. bulbosus* Hope (Trans. Linn. Soc.), qui constitue une espèce distincte.

Il en résulte immédiatement que *P. bulbosus* Hope, Cat., p. 20 qui constitue également une bonne espèce, doit recevoir un nouveau nom. Il me paraît bien juste de lui donner celui de Parry, qui a reconnu le premier la différence des deux *P. bulbosus* décrits par Hope.

Quant au *P. crenicollis* Thomson, je n'ai pas de notes sur les types de cette espèce, qui doivent faire partie de la collection de M. R. Oberthür, mais si je m'en rapporte à l'examen d'un spécimen qui faisait partie de la collection Mniszech et que j'ai trouvé dans la collection van de Poll avec l'étiquette "*Crenicollis*, comparé" il serait identique à l'insecte que j'ai décrit en 1904 (Le Naturaliste, 15, xii, p. 285) sous le nom de *P. mordax*. La description de Thomson, assez médiocre, s'applique à peu près à cet insecte. J'ai peu de doutes que le *P. laticeps* Möllenkamp dont la description a paru à la même date (Ins. Börse, 15, xii, p. 402) soit une espèce distincte de celle-ci, mais sa description est trop sommaire pour que je puisse l'affirmer absolument.

En étudiant le type du *P. mordax*, et le spécimen du *P. crenicollis* mentionné ci-dessus, ainsi qu'un exemplaire de la même espèce qui se trouve conservé au British Museum et porte l'indication "*spencei* Hope, *crenicollis* Thomson," il m'a paru probable que ces trois insectes appartiennent à des formes mineures plus ou moins développées du *P. spencei*. Le passage de la forme mineure de grande taille à la forme maxima, étant très brusque dans ce groupe, il est difficile d'arriver à une certitude complète tant qu'on n'a pas vu une série suffisante de spécimens de taille variée, mais la synonymie me paraît d'autant plus vraisemblable qu'on ne connaît aucun autre insecte pouvant représenter la forme mineure du *P. spencei*.

Si mes conclusions sont correctes, on peut donner le tableau suivant des quatre espèces affines qui constituent ce petit groupe :

A. Saillie de l'épistome simple.
  a. Suture du menton formant une carène lobée chez les exemplaires de grand et moyen développement.
  b. Une dent supérieure médiane chez les mâles de développement maximum.—1.
1. *P. bulbosus* Hope Trans. Linn. Soc., 1841, p. 589, pl. 40, fig. 2.
  c. Suture du menton formant une carène simple chez les exemplaires de grand et moyen développement.
  d. Pas de dent supérieure médiane chez les mâles de développement maximum.—2.

2. *P. spencei* Hope Trans. Linn. Soc., 1841, p. 589.—
   Synonymes : *P. crenicollis* Thomson, Ann. Soc. Ent. Fr., 1862, p. 418.
   P. mordax, Boileau, Le Naturaliste, 1904, p. 285.
   ? *P. laticeps*, Möllenkamp, Ins. Börse, 1904, p. 402.

B. Saillie de l'épistome bituberculée.
  a. Une dent supérieure médiane chez les mâles de développement maximum.
  b. Suture du menton formant une carène lobée chez les exemplaires de grand et moyen développement.—3.

3. *P. parryi* n.n. (= *P. bulbosus*) Hope, Cat., p. 20.
  c. Suture du menton formant une carène simple chez les exemplaires de grand et moyen développement.—4.

4. *P. dentifer* H. Deyrolle, Ann. Soc. Ent. Belg., 1865, p. 29, tab. 1, fig. 5.

Pour cette dernière espèce, très rare jusqu'à présent, j'ajouterai que la taille est plus petite et que les côtés du prothorax sont très faiblement crénelés.

Prosopocoelus tenuipes Hope, Cat., p. 18. Le type du musée d'Oxford est une femelle brillante, appartenant évitemment a un *Prosopocoelus* de la section du *P. buddha* Hope. D'après es étiquettes anciennes, elle aurait été envoyée des Philippines, par Cuming. La synonymie donnée par Parry (Cat., 1864, p. 81) = *cavifrons* ♀, paraît exacte.

Prosopocoelus curvipes Hope, Cat., p. 25. Le type d'Oxford est une femelle de très petite taille, noire et très brillante, ayant un aspect bien distinct de celui des autres femelles du groupe. Outre l'étiquette d'origine "Poona" cet insecte porte l'indication suivante : "*Figuloides* Parry, ♀, allied to *bulbosus*." Parry a décrit (Cat. 1864, p. 35) le mâle de cette curieuse petite espèce dont les rares exemplaires ne se trouvent que dans les anciennes collections. Quoique très distincte, c'est en effet du groupe du *P. bulbosus*, plus spécialement du *P. spencei* qu'on peut la rapprocher. Le grand développement est inconnu. Il existe au British Museum deux mâles, dont l'un porte une note de Parry "not in Hope's coll." Ce n'est pas le type, qui doit se trouver actuellement dans la collection de M. R. Oberthür. L'autre mâle est intéressant comme appartenant à une forme minima de l'espèce.

Aulacostethus archeri Waterhouse, Trans. Ent. Soc. Lond., 1869, p. 14 pl. iii, figs. 1, 1 *a*, 1 *b*.—L'insecte paradoxal, difficile à classer, très exactement décrit par M. Waterhouse, est, à ma connaissance, resté unique jusqu'à présent. Il présente un curieux mélange de caractères dont plusieurs peuvent faire supposer une adaptation à une vie partiellement souterraine: réduction des yeux, position de ces organes, gracilité et brièveté des tarses, élargissement considérable des extrémités des tibias médians et postérieurs qui semblent disposés pour pousser en arrière [B.M.] [Pl. IX, fig. 12 *a*, antenne; 12 *b*, extrémité du tibia postérieur.]

Homoderus johnstoni Waterhouse (in Johnston, Uganda Protectorate, 1902, i, p. 460). Un spécimen femelle, conservé au British Museum, sans doute le type de l'espèce. Elle porte l'indication de localité "Entebbe. Oct. 1900." et une étiquette "Sir H. H. Johnston, 1901, 281." C'est une femelle de forte taille qui a la couleur d'un rouge obscur de l' *H. gladiator* Jakowleff. Elle ressemble extrêmement à la femelle du *preussi* Kolbe. Sa validité spécifique me semble très douteuse.

Prismognathus platycephalus Hope, Proc. Ent. Soc. Lond., 1842, p. 83. Le type, conservé à Oxford, grand exemplaire mâle.

Cantharolethrus buckleyi Parry, Trans. Ent. Soc. Lond., 1872, p. 77, tab. 1, fig. 1 ♂, fig. 2 ♀. Le musée d'Oxford possède deux mâles et une femelle de cette rare espèce. Le grand mâle et la femelle sont les types de Parry.

Cyclommatus strigiceps Westwood, Cab. Or. Ent., p. 18, tab. 8, fig. 5. Le type, conservé à Oxford, bien conforme au dessin donné par Westwood: c'est un mâle de grand développement, ne présentant aucune macule sur le disque du pronotum.

Cyclommatus multidentatus Westwood, Cab. Or. Ent., p. 18, tab. 8, fig. 3. Cette espèce a été considérée par Parry (Cat., 1864, p. 84) comme étant synonyme de la précédente (*strigiceps* var. min.). L'exemplaire décrit par Westwood doit être celui qui se trouve dans la série du British Museum avec l'étiquette ancienne "E. India" "Type *Cyclophtalmus multidentatus* locat. in Or. Entomology." Ce mâle, qui appartient à la forme mineure, se distingue immédiatement des autres *C. strigiceps* de développement analogue par sa taille notablement plus forte, sa couleur plus rougeâtre, les côtés du prothorax plus parallèles avec l'angle médian moins épineux, les élytres plus striées. Je ne puis le considérer comme appartenant à la même espèce; il en est voisin, mais distinct. Il serait utile de le comparer à des *C. mniszechi* de même développement.

Cyclommatus affinis Parry, Trans. Ent. Soc. Lond., 1864, p. 40. Le type de Parry est conservé au British Museum; c'est un spécimen de forme moyenne, dont le dent basale est quadridentée; l'épistome est un pentagone dont les quatre côtés libres sont légèrement concaves. Avec ce mâle s'en trouve un autre, de plus grand développement, qui paraît aussi provenir de la collection Parry. Chez celui-ci la dent basale est simple et le triangle curviligne antérieur de l'épistome forme des pointes aiguës aux angles; le lobe interne de la région latérale antérieure de la tête, contre la mandibule, est très relevé.

M. Ritsema a admis la synonymie *C. affinis* Parry = *C. de haani* Westwood. Je n'ai pas assez d'éléments pour discuter actuellement cette question, je dois dire toutefois que les *C. de haani* de Sumatra, déterminés par M. Ritsema, que je possède, me paraissent différer sensiblement du type du *C. affinis* conservé au British Museum. La question de provenance des deux espèces devrait être tout d'abord bien éclaircie. D'après Westwood, le *C. de haani* était de Java. Il se trouve ainsi indiqué dans le Catalogue Hope, p. 5, et dans les trois Catalogues de Parry. Dans le Cabinet Oriental, il est donné comme provenant de Bornéo, mais on peut se demander si ce n'est pas à la suite de son identification présumée (et d'ailleurs inexacte) avec le *C. rangifer* Schönherr (= *tarandus* Thunberg). Le *C. macrognathus* White MSS. cité par Westwood comme étant un grand exemplaire du *C. de haani* paraît bien être un *C. tarandus*, et c'est à lui certainement que s'applique le renseignement de la capture faite par M. Hugh Lowe à Bornéo.

Outre cet exemplaire qui aurait fait partie des collections du British Museum, et que je n'ai pas remarqué, Westwood indique que l'espèce existait dans la collection Hope et dans la collection Melly. Je ne puis rien dire de celle-ci, où paraît être le type véritable. L'exemplaire de la collection Hope, conservé à Oxford, porte l'étiquette suivante : "*de haani* ♂ var. minor." "Sumatra." "Mus. Melly for type." Ce spécimen est un mâle de faible taille (28 mm.) dont les mandibules présentent un groupe basal et un groupe terminal de plusieurs denticules, les deux groupes étant séparés par un large intervalle inerme. Son aspect est celui d'un *C. canaliculatus* Ritsema, var. minor. Avec lui sont trois spécimens, qui semblent intermédiaires entre le *C. canaliculatus* typique et le *C. frey-gessneri* Ritsema. Les exemplaires de *C. de haani* du British Museum sont des *C. frey-gessneri*, *canaliculatus* et *consanguineus*, les seuls exemplaires qui se rapprochent du *C. de haani*, tel que nous le comprenons, sont les spécimens de *C. affinis* venant de la collection Parry, cités plus haut.

Cyclommatus faunicolor Hope, Proc. Ent. Soc. Lond., 1844, p. 106. L'exemplaire conservé au musée d'Oxford, avec l'étiquette ancienne *C. faunicolor*, semble pareil à celui figuré par Westwood (Trans. Ent. Soc., 1847, pl. 20, fig. 1) mais ne porte aucune indication de type.

Leptinopterus polyodontus Hope, Cat., p. 15. Les deux spécimens d'Oxford sont très vraisemblablement les types de Hope. Le mâle porte la provenance " Bz." (Brazil) la femelle l'étiquette "*polyodontus*." Ce sont deux *L. ibex* Billberg, un grand mâle nettement caractérisé, une belle femelle.

Parry, dans son travail de 1864, n'a pas signalé cette synonymie et a laissé subsister le *L. polyodontus* Hope comme espèce distincte. Il est à remarquer, cependant, qu'il a donné, comme synonyme du *L. ibex* le *L. polyodontus* Dejean, d'après Reiche, Ann. Soc. Ent. Fr., ser. 3, i, p. 78.— Or dans le Catalogue Hope, l'indication " Dej. inédit " est donnée en tête de la description de l'espèce. Le *Leptinopterus polyodontus* Hope n'existe donc pas comme espèce. C'est Burmeister qui a réellement décrit le *L. polyodontus* tel que nous le comprenons (Handbuch, vol. v, p. 381).

Leptinopterus rufifemoratus Hope, Cat., p. 5, est bien la femelle de *L. femoratus* Fab., comme l'ont indiqué Hope lui-même (*loc. cit.*) et Parry. (Cat. 1864, p. 85). U. O.

Leptinopterus melanarius Hope, Cat., p. 15. Le type est un mâle de grand développement, qui correspond bien à la description du Catalogue. La mandibule porte une double dent basale peu développée, une forte dent intermédiaire, et se termine par trois denticules [pl. IX, fig. 4, mandibules]. Il porte simplement l'indication de provenance " Bz." et l'étiquette "*melanarius* Hope Bz." Le British Museum possède plusieurs spécimens tout à fait pareils dont deux indiqués de " São Paulo." Il n'y a pas de doute d'après la description de Burmeister (Handbuch, v, p. 379) que son *L. morio* ne soit identique au *L. melanarius*.

Leptinopterus funereus Hope, Cat., p. 15. Les types sont un mâle moyen et une femelle. Il y a, de plus, un mâle minimum. Le plus grand des deux mâles a des mandibules assez développées, dépourvues de dent médiane, mais l'extrémité est formée par trois denticules comme chez le *L. melanarius.* Les tibias médians, chez ces deux types, portent une épine, précédée d'une autre très petite. La ponctuation est analogue. L'identité spécifique, admise par Parry (Cat., 1864, p. 85) me semble très probable. U. O.

Leptinopterus politus Hope MSS., localité " Bz." (Brazil) conservé à Oxford, est une femelle de *L. ibex* Billberg.

Leptinopterus ochropterus Hope MSS., spécimen portant les indications " Mex." et " *Ochropterus* mihi " est un mâle moyen de *L. tibialis* Eschscholtz. U. O.

Leptinopterus v-niger Hope, Cat., p. 15. Plusieurs mâles, et probablement une seule femelle ont servi à établir la diagnose. Le mâle portant l'étiquette type, à Oxford, est un spécimen de taille moyenne, de forme majeure, étiqueté " *v-niger* Hope." Il existe d'autres mâles étiquetés *Psalicerus cuspidatus.* La femelle ne porte aucune étiquette ancienne.

Leptinopterus fraternus Westwood, Trans. Ent. Soc. Lond., 1874, p. 359, tab. 3, fig. 3, ♂. Les types, mâle et femelle, sont conservés au British Museum.

Leptinopterus erythrocnemus Burmeister, Handbuch, v, p. 378. Le British Museum possède plusieurs spécimens de cet insecte. Chez un mâle et deux femelles, on constate le passage à la forme typique, qui est le *L. tibialis* Eschscholtz, dont le *L. erythrocnemus* ne doit être considéré, à mon avis, que comme une variété.

Macrocrates bucephalus Hope, Cat., p. 15. Le type, conservé à Oxford, est un beau spécimen mâle. Il existe également, dans la collection, sous les noms inédits de *Psalicerus rotundicollis* Gory, *nigripes* Dej. une femelle appartenant à la même espèce.

Odontolabis burmeisteri Hope, Trans. Ent. Soc. Lond., 1839, p. 279, tab. 13, fig. 3. Cat., p. 16. Le type est un mâle de forme majeure, bel exemplaire, mais plus grêle que ceux ordinairement conservés dans les anciennes collections. Il porte l'indication de provenance " Assam " qui est erronée et en désaccord avec la diagnose qui donne " Mysore." U. O.

Odontolabis cuvera Hope, Trans. Linn. Soc., 1843, p. 105, tab. 10, fig. 3. Le type est bien conforme au dessin mais ne porte plus aucune étiquette ancienne. C'est un spécimen de forme majeure, de taille plutôt faible. U. O.

Odontolabis prinsceppi Hope, Cat., p. 16. Comme l'a indiqué Parry (Cat., 1864, p. 75) le type est un mâle de forme moyenne (f. mesodont Leuthner). U. O.

Odontolabis saundersi Hope, Trans. Linn. Soc., 1843, p. 105. Cat. p. 16. Le Catalogue mentionne sous le nom de *O. delesserti* Guérin (= *O. saundersi* Hope, Cat. p. 5) un couple. La collection d'Oxford contient une femelle qui, comme l'a indiqué Parry (Cat., 1864, p. 75) est *O. cuvera*; ce spécimen provient de Khasyah-Hills. Deux mâles sont étiquetés comme *O. saundersi* Hope. Le plus grand porte une étiquette rouge, de Hope, " *Saundersii* Hope " et une autre blanche : " *bicolor*." D'après l'étiquette du Musée ce serait le type d' *O. bicolor* Saunders, Trans. Ent. Soc. Lond., ii, p. 177; tab. 16, fig. 3. Toutefois, le deuxième mâle, plus petit, tout à fait de la forme priodont, porte une étiquette ancienne : " described by Saunders," probablement de Hope. Il y a un petit doute sur la question de savoir lequel est le type du *bicolor* Saunders et lequel du *delesserti* Hope, mais aucun sur le fait que ce sont tous deux des *O. cuvera*. Hope ne semble pas avoir possédé le véritable *O. delesserti* Guérin : tous les spécimens de sa collection sont des *O. cuvera* venant de " Khasyah-Hills."

Odontolabis sinensis Westwood, Cab. Or. Ent., p. 54, tab. 26, fig. 2, 3, ♂; fig. 4, ♀. Les types figurés par Westwood sont conservés à Oxford.

Odontolabis dux Westwood, Ann. Mag. Nat. Hist., 1846, p. 124. L'énorme exemplaire sur lequel a été fondée cette espèce (= *alces* Fabr. f. telodont) et qui a été figuré par Westwood (Cab. Or. Ent., p. 17, tab. 8, fig. 1) est conservé au British Museum.

Odontolabis cumingi Hope, Cat., p. 17. Le type, exemplaire de forme moyenne (amphiodont) d' *O. alces* porte de très nombreuses étiquettes anciennes. Il a été disséqué pour vérifier son sexe. Sa provenance est Manille. U. O. C'est au British Museum que se trouve conservée la curieuse série des têtes d'*O. alces*, figurée par Leuthner (Monographie, p. 399) à l'appui de sa distinction des quatre principales formes mandibulaires des lucanides de ce groupe. Cette division ne s'applique d'ailleurs qu'à un nombre restreint d'espèces; elle est en discordance avec ce qu'on remarque dans d'autres genres.

Odontolabis siva Hope, Cat., p. 16. Le mâle type est un petit amphiodont. Il a été envoyé par le Dr. Cantor, d'après l'ancienne étiquette. La femelle type est également conservée à Oxford. Ainsi que l'a reconnu Leuthner (Monographie, p. 438) l'indication Java, donnée par Hope, Cat., p. 16, en contradiction avec celle donnée Cat., p. 5, est erronée. L'erreur commise provient sans doute de ce que cette espèce a été confondue avec *O. bellicosus*, Castelnau, qui en est assez voisine et vient de Java.

Odontolabis vishnu Hope, Cat., p. 17. Le type est un mâle amphiodont de *O. bellicosus* Castelnau, ainsi que l'a reconnu Parry. (Cat. 1864, p. 76.) L'étiquette ancienne indique la provenance " Java " et porte la mention " *Gazella* ♂ Hope " au dessus de laquelle est écrit : " *Vishnu.*" Cette indication concorde avec celle du Catalogue, p. 5. " *Vishnu* Hope, Java, an. *L. Gazella* mes. Fabr." qui est d'ailleurs erronée. U. O.

Odontolabis serrifer Hope, Cat., p. 17. Sous ce nom sont conservés deux petits exemplaires de forme mineure (priodont), qui paraissent être des *O. bellicosus*, comme l'a indiqué Parry (Cat., 1864, p. 76). U. O.

Odontolabis dalmani Hope, Cat., p. 17. Le type est un assez grand mâle qui ressemble, comme forme, aux exemplaires de cette espèce provenant de Sumatra. La diagnose indique comme provenance " Tenasserim," ce qui est possible. Aucune étiquette ancienne n'a été conservé pour cet insecte. U. O.

Odontolabis platynotus Hope, Cat., p. 18. Les spécimens considérés comme types par le musée d'Oxford sont deux femelles, dont l'une porte une étiquette ancienne " *glabratus* " et la provenance : " East India." Cette dernière, un peu plus courte que l'autre, paraît être le type véritable.

Odontolabis emarginatus Saunders, Trans. Ent. Soc. Lond., 1854, p. 49, pl. 3, figs. 4, 5. Trois exemplaires, deux mâles, une femelle, sont conservés sous ce nom à Oxford, mais sans indication de type. Il n'est pas impossible que le plus grand des deux mâles soit un des exemplaires de la collection Saunders. Son étiquette, analogue à celle des autres lucanides provenant de cette collection, porte les indications : " *Odontolabis emarginatus* (Reiche MS.) ♂ minor. W.W.S. Trans. Ent. Soc., n. s., vol. 3, pl. 3, fig. 5 ♂ minor nec ♀." Parry a donné (Cat., 1864, p. 77) la synonymie *O. platynotus* Hope. Leuthner (Monographie, p. 436) a émis l'hypothèse que la provenance indiquée par Hope était inexacte. En réalité, la distribution géographique de

O. platynotus paraît étendue, cette espèce, généralement reçue de Chine, se trouve aussi en Indo-Chine, au Tonkin, et Fea en a rapporté un exemplaire de Birmanie. J'ai vu plusieurs exemplaires indiqués de l'Inde, mais sans localité précise.

Odontolabis femoralis Waterhouse, Ann. Mag. Nat. Hist., 1887, p. 486.—Cette espèce, dont les types, provenant de Perak, ont été rapportés par M. Doherty et se trouvent au British Museum, n'est pas autre chose que l'énorme espèce retrouvée a Kina-Balu par M. Waterstradt, et décrite, sous le nom de *O. waterstradti*, par M. von Rothenburg, Deutsche Ent. Zeitschr., 1900, p. 84.

Les deux mâles de Perak ont le pronotum rougeâtre, l'un d'eux a même les angles latéraux marqués de jaune. Une femelle de Perak figure également dans la collection.

Cette espèce a dû être reçue antérieurement à 1887, car j'en ai trouvé, dans la collection Armitage, un mâle, visiblement ancien, indiqué "*Odontolabris* n. sp. Penang." Le pronotum de ce spécimen est légèrement rougeâtre.

Il est intéressant, au point de vue de la distribution géographique des espèces, de voir cette espèce de Malacca se retrouver dans la région nord de Bornéo.

Au sujet de cet *Odontolabis*, il est utile de faire remarquer que M. Möllenkamp a cru devoir considérer que *O. waterstradti* n'était pas la forme typique de l'espèce mais une variété, et a décrit, en conséquence, comme forme typique, son *O. kinabaluensis* (Ins. Börse, 1904, p. 341). Il convient de faire toutes réserves sur ces appréciations de ce qui est ou n'est pas la forme typique d'une espèce encore fort peu connue. On peut évidemment concevoir la forme typique comme représentant la moyenne des formes variables de l'espèce. Mais la détermination de cette moyenne est excessivement délicate et, actuellement au moins, la seule règle logique à suivre pour la nomenclature consiste à respecter les antériorités.

Partant de là, le nom véritable de l'espèce est *O. femoralis* Waterhouse; la forme typique est celle de Perak à pronotum légèrement rougeâtre et même marqué de jaune aux angles latéraux. *O. waterstradti* Rothenburg et *O. kinabaluensis* Möllenkamp ne représentent que deux variétés, la première est même très douteuse comme validité, et doit plutôt être considérée comme une sous-variété ou race locale.

Odontolabis latipennis Hope, Cat., p. 17. Le type, conservé à Oxford, est une femelle étiquetée "*Dejeanii* Reiche, *latipennis* Hope verus" "Pr. Wales." (Prince of Wales Isl.)

Odontolabis cephalotes Leuthner, monographie, p. 478. Le spécimen, jusqu'à présent, je crois, seul connu de cette espèce, est conservé au British Museum.

C'est un grand mâle, entièrement différent de l' *O. striatus* Deyr. et qui appartient, sans aucun doute, à une espèce bien distincte.

L'hypothèse faite par M. van Roon dans son Catalogue des Lucanides (Tijdschr. v. Ent., i, 1907, pp. 58–70).—Tirage à part p. 63, reproduite d'ailleurs dans la Pars 8 du Coleopterorum Catalogus de Junk, du même auteur, p. 39 (*O. cephalotes* Leuthner, placé avec un peu de doute dans le genre *Eulepidius*) est d'ailleurs sans fondement. L'insecte n'a rien de commun avec *Eulepidius luridus* Westw., type du genre, qui est un proche parent des *Gnaphaloryx*, et il appartient bien aux *Odontolabis*. La différence la plus frappante entre *O. cephalotes* et *O. striatus* est dans la forme de la tête et des mandibules. Ces dernières, aplaties en largeur chez *O. striatus*, sont au contraire comprimées latéralement chez *O. cephalotes*. La dent basale est simple au lieu d'être double comme chez *striatus* et il existe une forte carène, surplombant le front, qui fait défaut, même chez les plus grands mâles connus de *striatus*.

Il convient de remarquer que cette forme, assez spéciale pour le genre, se retrouve, autant qu'on en peut juger par la figure publiée, chez *O. sarasinorum* Heller, espèce des Célèbes, également de petite taille, vraisemblablement apparentée à *O. cephalotes* Leuthner.

Odontolabis elegans Möllenkamp, Ins. Börse, 1902, p. 363.—Je crois utile de signaler ici qu'il existe au British Museum une femelle provenant de Malacca, ex collection Atkinson, sous le nom de *O. gazella*, qui ressemble tout à fait à la femelle de *O. elegans*. M. Zang a soutenu que *O. elegans* Möll. devait être considéré comme un simple synonyme de *O. mouhoti* Parry, hypothèse qui a été repoussée avec une véritable indignation par M. Möllenkamp, qui s'est basé sur les "800,000 kilomètres carrés" qui existent entre Carin Cheba (Birmanie), patrie de *O. elegans*, et le Cambodge, patrie de *O. mouhoti*, et sur ses "25 années d'études sur les Lucanides" pour déclarer que M. Zang manquait de toute preuve à l'appui de son affirmation.

Je dois dire que je ne puis partager cette manière de voir, et qu'ayant reçu, de M. Gestro, les chasses de M. Fea, en

Birmanie, d'où proviennent tous les exemplaires connus de *O. elegans*, je n'ai pas cru pouvoir décrire cette espèce, tant elle me paraissait proche de *O. mouhoti*. M. Möllenkamp déclare que *O. elegans* est " un petit lucanide gracieux," tandis que *O. mouhoti* a la tête large, et que les élytres de *O. elegans* ne sont pas aussi longues que celles de *O. mouhoti* sont larges. En réalité *O. mouhoti* est un peu plus grand que les spécimens connus de *O. elegans*, cependant le plus grand mâle (telodont) du Musée de Gênes mesure 66 mm. (mand. incl.); les élytres ont 26 mm. de long., la tête a 20·5 de large. *O. mouhoti* mesure 64 mm., avec des élytres de 28 mm. et une tête de 22·5. La couleur ne semble pas différer sensiblement et, sur une des excellentes planches photographiques exécutées d'après quelques-unes des boîtes de la collection R. Oberthür, on peut se rendre compte que l'aspect général n'est pas très différent. D'après la figure de Leuthner, le dessin des élytres est tout à fait pareil. Si nous retrouvons, à Malacca, la femelle de *O. elegans*, l'objection des " 800,000 kilomètres carrés " qui justifient, aux yeux de M. Möllenkamp, la séparation, sans comparaison, de deux espèces aussi voisines se trouve également très affaiblie, car il y a une bonne distance, me semble-t-il, entre Carin Cheba et Malacca.

Sans affirmer l'identité ou la différence des deux espèces, ce que l'examen du type de *O. mouhoti* permettrait seul de faire, je tiens à dire que l'opinion de M. Zang praraît au moins aussi fondée que celle de son contradicteur.

Odontolabis lowei Parry, Trans. Ent. Soc. Lond., 1873, p. 336, pl. 5, fig. 1.—Le type figuré, conservé au British Museum, ne diffère pas des spécimens reçus de Kina-Balu à une époque récente.

Chalcodes carinatus Linn., Syst. Nat., i, 2, 1735, p. 560. On sait que H. Deyrolle a cru pouvoir séparer en trois espèces distinctes le *C. carinatus* L.: *C. cingalensis* Parry, *C. intermedius* Deyr. et *C. nigritus* Deyr. Les collections du British Museum contiennent un bon nombre de spécimens de ces diverses formes, qui ne sont d'ailleurs pas rares dans les collections, quoique *C. nigritus* soit certainement moins répandu que *C. cingalensis*. Une carte est jointe à cette série et donne la distribution géographique des trois espèces présumées distinctes. D'après ce document, *C. nigritus* et *C. intermedius* seraient propres à Ceylan, tandis que *C. carinatus*, également représenté à Ceylan, se retrouverait sur toute la côte de Calcutta à Madras.

L'examen d'un grand nombre d'exemplaires me fait admettre qu'il existe certainement deux espèces : *C. carinatus* L. (*cingalensis* Parry) qui est la grande espèce, légèrement pubescente, et *C. nigritus* Deyr., de taille notablement plus faible, très noir, brillant, beaucoup plus anguleux comme contours. Quant au *C. intermedius* Deyr., je ne puis arriver à le considérer comme autre chose que la forme mineure du *C. carinatus.*

Le type du *C. cingalensis* Parry doit se trouver dans la série du British Museum, mais je ne l'ai pas spécialement remarqué ; il n'existe d'ailleurs aucun doute sur l'identification de cette espèce à la suite du travail de Leuthner.

Chalcodes aeratus Hope, Trans. Zool. Soc., 1835, p. 99, pl. 14, fig. 2. Cat., p. 16. Deux mâles types sont conservés à Oxford. Quoique la diagnose du catalogue indique comme provenances Tenasserim et Pr. Wales Isl., un de ces exemplaires porte l'indication de localité " Khasyah Hills " qui résulte sans doute d'une confusion.

Neolucanus saundersi Parry, Trans. Ent. Soc. Lond., 1864, p. 20, pl. 9, fig. 3. Les types de cette espèce sont conservés dans la collection R. Oberthür ; il existe cependant, dans la collection du British Museum un petit mâle étiqueté : " Bowring, 63, 47, India " qui porte la mention manuscrite de Parry : " *Saundersi,* priodont type." Cet insecte est un *N. lama* Ol. La femelle qui l'accompagne, provenant également des chasses de Bowring, est aussi *N. lama.*

Neolucanus baladeva Hope, Trans. Linn. Soc., 1843, p. 105. Cat. p. 17.—Les deux types mâles et le type femelle existent dans la collection d'Oxford. Ce sont des *N. lama* Olivier, ainsi qu'on l'admet d'ailleurs généralement. Le plus grand mâle vient de Khasyah Hills. Le deuxième porte la mention : " *Ursus* Lap. descriptio nec figura convenit," observation également faite dans la diagnose. (*N. ursus* Lap. est *O. bellicosus* femelle.)

Neolucanus angulatus Hope, Cat., pp. 17, 18. Cette espèce a été considérée par Parry (Cat. 1864, p. 78) comme représentant la forme mineure de *N. lama* ou *baladeva.* Cette opinion a toujours été considérée comme correcte. Le doute, cependant, était permis. Il existe certainement deux espèces, confondues dans les collections sous le nom de *lama* et qui, toutes deux, sont reçues des mêmes localités. La plus grande, plus large et plus plate, présente, chez les grands mâles, une dent supérieure dressée à l'extrémité des mandibules. Celles-ci sont donc fourchues. La plus petite, plus étroite, plus parallèle, n'a jamais, même chez les plus forts exemplaires, aucune trace de dent apicale dressée, les mandibules sont simples à la pointe. La grande espèce a les canthus oculaires saillants, souvent très anguleux et même épineux, la tête toujours très plate, le métasternum ne porte aucune dépression. La petite espèce a les canthus plus arrondis, ne formant jamais une saillie épineuse, la tête est plus renflée en dessus et par derrière, le métasternum porte toujours une dépression en lozange très marquée. Des différences analogues permettent de séparer aisément les femelles : celles de la petite espèce sont bien plus faibles, plus étroites et surtout elles présentent toujours la dépression caractéristique du métasternum.

Leuthner, dans sa remarquable monographie, a signalé qu'il y avait une différence d'aspect entre les grands et les petits spécimens de *N. lama ;* il a même figuré une femelle de la petite espèce, mais il n'a pas vu les différences constantes qui séparent les deux formes; il se borne à dire que Hope a nommé *Lucanus angulatus* la petite forme, qu'il considérait comme une espèce distincte. (Leuthner, Monographie, p. 431.)

Ayant depuis assez langtemps reconnu l'existence des deux espèces, je m'étais toujours demandé si le type de *N. angulatus* Hope appartenait bien à la plus petite; je pensais être immédiatement fixé à Oxford, mais il n'en a pas été tout à fait ainsi.

L'insecte indiqué comme *angulatus* type dans la collection du Musée est un petit mâle de la petite espèce; il mesure seulement (la tête un peu inclinée) 36 mm. Ce spécimen porte l'indication : " *Angulatus* Hope " " ? *baladeva* var." Ce n'est évidemment pas le spécimen mentionné dans la diagnose comme ayant 21 lignes.

Deux femelles, de la même espèce, sont avec ce mâle; elles mesurent 36·5 mm. et sont indiquées de Khasyah Hills, étiquettes anciennes; elles dépassent un peu la mesure de 16 lignes indiquée par la diagnose : 16 lignes.

Deux autres mâles, plus grands, conservés dans la même série que les insectes précédents, ont la même étiquette "Khasyah Hills" ; ils mesurent respectivement 41 et 45 mm. (environ 19½ et 21¼ lignes), mais ils appartiennent à la grande espèce.

Par contre, il existe encore deux mâles de la petite espèce, dont un seul porte une étiquette ancienne " K. Hills." L'autre paraît plus récemment reçu. Il est à remarquer que le premier a son épingle coupée de la même manière que celle du petit mâle type ; c'est un insecte réparé, recollé, qui a pu perdre une partie de ses étiquettes anciennes ; il mesure 45·5 mm. (environ 21½ lignes), ce qui concorde sensiblement avec l'indication du catalogue.

Leuthner indique 40 mm. comme longueur du *N. angulatus* Hope, mais il ne dit pas que la mesure s'applique au type.

Toutes les probabilités me paraissent être pour que le type véritable soit le mâle de 45·5 mm., mais il y a cependant une petite chance pour que ce soit un des mâles de l'autre espèce. Au British Museum, il existe quatre mâles anciens de la petite espèce, et les indications qu'ils portent viennent à l'appui de la première hypothèse. Un des mâles qui paraît avoir été étiqueté par Westwood porte : " *Angulatus*, Hope's Collect." : un autre, " *Angusticollis*, Hope's coll." Le troisième, par contre, est étiqueté, " *Chalcodes* ? *Baladeva* Hope."

Je crois, en définitive, que l'on peut admettre l'identification de la petite espèce au *N. angulatus* Hope (Westwood) et je propose en conséquence de lui restituer ce nom.

En plus des insectes mentionnés ci-dessus, se trouve, à Oxford, un spécimen qui correspond à la dernière phrase de la diagnose : " Varietas Assamensis mandibulis parum brevibus . . . etc." Cet insecte est un *N. saundersi* Parry, de forme mineure. Il porte d'ailleurs une mention qui paraît être de Leuthner : " *Saundersi* Parry nec Hope ♂."

Neolucanus glabratus De Haan, inédit ; Hope, Cat., p. 18. Albers a parfaitement indiqué que la diagnose du *Lucanus laticollis* Thunberg ne pouvait s'appliquer à un *Neolucanus* et que la synonymie donnée par Reiche entre les deux espèces était inexacte. Cette espèce est représentée à Oxford par plusieurs spécimens, dont deux mâles indiqués comme types. Le plus grand seul correspond aux dimensions données par la diagnose, mais tous deux portent une étiquette ancienne " *Glabratus* De Haan." Un troisième mâle, plus petit, a en plus la mention " Java, Burm." Une femelle porte la même étiquette que les deux premiers mâles. La provenance Assam doit être le résultat d'une erreur.

Deux autres femelles, indiquées comme " *Dorcus puncticeps* Hope " sont aussi des *N. glabratus* Hope.

Neolucanus nitidus Saunders, Trans. Ent. Soc. Lond., 1854, pl. 4, fig. 1.—Trois de ces insectes figurent dans la collection d'Oxford et ont tous les mandibules arrachées, procédé pour tuer les insectes spécialement peu recommandable pour les lucanides. Le plus grand mâle, qui est l'exemplaire figuré, est le seul portant l'étiquette : "*Odontolabi*(*s*) *niti*(*dus*) *m*(*ihi*)" tronquée; c'est le vrai type, il mesure 38 mm., les deux autres ont respectivement 35 et 32 mm. Le premier a une indication de provenance : "Shangaï, Mr. Fortune."

Cette espèce est restée peu commune. D'après les mâles que je possède, les mandibules sont assez courtes, elles portent une fourche à l'extrémité apicale et quatre forts denticules sur leur longueur. Mes exemplaires ne sont pas très développés, leur taille est un peu plus faible que celle du type figuré, qui n'est probablement pas lui-même un réellement grand exemplaire. La femelle est assez allongée, régulièrement ovalaire, moins brillante sur les élytres que les mâles, les angles latéraux du prothorax sont légèrement arrondis, les canthus oculaires sont très arrondis, ainsi que le contour externe des mandibules. Mes spécimens sont du Fokien.

Neolucanus championi Parry, Trans. Ent. Soc. Lond., 1864, p. 20.—La collection d'Oxford possède plusieurs spécimens de cette espèce. Le plus grand mâle est le type de Parry, il appartient à la forme majeure; les trois autres mâles, ainsi que la femelle, viennent également de la collection Parry; la femelle a été décrite et figurée par Leuthner, avec le grand mâle (Monogr. p. 428, pl. 85, figs. 8 ♂, 6 ♀).

Le grand mâle ressemble beaucoup à un *N. opacus* Boil. qui serait entièrement dépoli et de forme grêle. Les canthus sont tout à fait arrondis. La dent supérieure apicale est forte et se relie à la dent inférieure par une courbe peu concave.

Parry a indiqué (*loc. cit.*) que le type avait été envoyé de Hong-Kong par le Major Champion, mais que d'autres spécimens avaient été depuis rapportés de l'intérieur de la Chine par Mr. Fortune. Des quatre spécimens d'Oxford, le premier, le troisième et le quatrième mâle, ainsi que la femelle, sont de Hong-Kong. Le deuxième mâle a comme provenance "China or Thibet," c'est un petit spécimen et son attribution à l'espèce est peut-être un peu douteuse. Les exemplaires du *N. championi* du British Museum, assez nombreux, sont de la provenance "Victoria Peak—Hong-Kong."

Neolucanus sinicus Saunders, Trans. Ent. Soc. Lond. 1854, p. 48, pl. 4, figs. 2, ♂, 3, ♀.—Trois mâles indiqués comme rapportés par Mr. Fortune; le plus grand est indiqué comme type; il mesure 37 mm.; un autre, un peu plus petit, porte les mêmes étiquettes anciennes. La femelle d'Oxford n'est pas le type. Je crois les vrais types au British Museum, mais ne les ai pas revus.

Neolucanus parryi Leuthner, Monographie, p. 424, pl. 85, fig. 4. Deux exemplaires, au British Museum, dont le type, qui vient de Siam. L'autre spécimen, qui vient du Laos (Mouhot) diffère légèrement du type et se rapproche davantage du *N. leuthneri* Boil.

Neolucanus marginatus Waterhouse, Ent. Monthly Mag., 1873, p. 53. La femelle type est au British Museum, ainsi que le mâle considéré par Mr. Waterhouse comme se rapportant probablement à cette espèce. Ce dernier exemplaire porte l'indication de provenance "Lacken, Sikkim. 9000 feet." J'ai déjà signalé (Bull. Soc. Ent. Fr., 1899, p. 178) à la suite d'une communication verbale de M. R. Oberthür, que cet insecte n'était certainement pas le mâle du *N. marginatus*, qui est aujourd'hui bien connu, et qui est bicolore, comme sa femelle. Mais croyant que cet insecte était distinct, j'avais proposé de lui donner le nom de son descripteur, Mr. Waterhouse, nom sous lequel il figure dans le catalogue de Van Roon. (Coleopt. Catal. Jung. pars 8, p. 16.) Après avoir examiné le type, je ne vois pas de caractère permettant de le séparer du *N. lama* Ol.; c'est, à ce qu'il me semble, un très petit exemplaire de cette espèce.

Je ne crois pas non plus que les deux petits mâles bicolores conservés au British Museum soient des *N. marginatus*.

Neolucanus castanopterus Hope, in Gray, Miscell. Zool., 1831, p. 22: Cat., p. 18.—Le type est un mâle moyen, provenant du Nepaul, envoyé par le Général Hardwicke. U. O.

Hemisodorcus nepalensis Hope, in Gray, Zool. Miscell., i, 1831, p. 22: Cat. p. 19.—Le type mâle appartient à la forme moyenne; la femelle est également conservée à Oxford.

Hemisodorcus parryi Hope, Proc. Ent. Soc. Lond., 1843, p. 94: Cat. p. 20. Le type mâle est un *H. nepalensis* de forme mineure et de petite taille; la femelle type est également très petite. U. O.

Hemisodorcus rafflesi Hope, Trans. Linn. Soc., 1842, p. 588, est un grand mâle de *H. nepalensis*, forme majeure. U. O.

Hemisodorcus similis Hope, in Gray, Zool. Miscell. i, 1831, p. 22. D'après la diagnose, le type serait au British Museum; je n'ai pu le retrouver. Au contraire, il est indiqué par le musée d'Oxford comme faisant partie de sa collection. L'insecte ainsi désigné comme type est un *H. nepalensis* plus petit mais de plus grand développement mandibulaire que le *H. nepalensis* type. Les étiquettes anciennes semblent bien indiquer que cet insecte est le type du *H. similis.*

Parry (Cat., 1864, p. 86) a indiqué toutes ces synonymies, qui prouvent, une fois de plus, combien certains descripteurs ont de facilité à fractionner les espèces.

Hemisodorcus macleayi Hope, Cat., p. 19. Le type est un mâle de très grande taille pour l'espèce, de forme majeure. U. O.

Digonophorus atkinsoni Waterhouse, Ann. Mag. Nat. Hist., 1895, p. 157.—Un mâle (type ou cotype ?) est conservé au British Museum. J'ai déjà indiqué, d'après l'avis de M. R. Oberthür, que cet insecte était *Hemisodorcus elegans* Parry (voir Bull. Soc. Ent. Fr., 1899, p. 178). Cette espèce a une certaine affinité avec *Macrodorcus rubrofemoratus* Voll.

Hemisodorcus passaloides Hope, Cat., p. 24.—Le type femelle de cette petite espèce est conservé à Oxford.—Cet insecte est assez difficile à classer; il se rapproche des *Prosopocoelus* du groupe du *cilipes* Thomson par plusieurs caractères, mais ses affinités semblent plus réelles avec le *Ditomoderus mirabilis* Parry.

Ditomoderus mirabilis Parry, Trans. Ent. Soc. Lond., 1864, p. 45, pl. 12, figs. 6, 6*a*–6*e*. Le type mâle de cette intéressante espèce, certainement plus près des Cladognathides que des Dorcides vrais, se trouve au British Museum; c'est un très fort exemplaire, de Bornéo. Il est accompagné d'une instructive série de six autres spécimens, dont plusieurs de très petite taille, et de quatre femelles. Un des mâles, le quatrième comme grandeur, qui a aussi appartenu à Parry, montre une dissymétrie mandibulaire assez nette. Un mâle est de Sarawak, plusieurs de Penang.

Eurytrachelus briareus Hope, Cat., p. 20.—Cet insecte a été rapporté à *E. bucephalus* Perty par Parry (Cat., 1864,

p. 87). La description de Hope, surtout en ce qui concerne les saillies intermandibulaires et les mandibules ellesmêmes semblent en effet s'appliquer à cette espèce. J'ai bien cherché le type à Oxford. Le seul insecte portant l'étiquette "*Briareus* Hope" est un *Titan*, étalé avec les ailes ouvertes, dans la position du vol. C'est un exemplaire assez grand. Il ne porte aucune indication de provenance, mais une étiquette "Cantor" ferait supposer que c'est un exemplaire de l'Inde. Je doute beaucoup que ce soit le type, qui est probablement perdu.

Eurytrachelus tityus Hope, Proc. Ent. Soc. Lond., 1842, p. 83. Un mâle, assez grand, et bel exemplaire, est conservé à Oxford, c'est très probablement un cotype ou un exemplaire typique offert par Parry, d'après l'étiquette que porte cet insecte. Le catalogue de la vente de la collection de Parry, annoté par A. Sallé, semble indiquer que les types du *E. tityus* ont dû être acquis pour le British Museum, où je ne les ai pas remarqués.

Eurytrachelus falco Hope, Cat., p. 6.—L'insecte indiqué à Oxford comme type de cette espèce est un *E. tityus* de forme majeure qui porte les étiquettes "*falco* Laporte MSS." "falco Laporte?" Le *E. falco* est simplement mentionné p. 6 du Catalogue et n'a été décrit ni par Laporte de Castelnau, ni par Hope ou Westwood.

Eurytrachelus punctilabris Hope, Proc. Ent. Soc. Lond., 1842, p. 84 : Cat. p. 21.—Parry (Cat., 1864, p. 88) a rapporté cette espèce à *E. reichei* Hope. Je ne puis me ranger à son opinion. Le type, conservé à Oxford, a les mandibules grêles armées de deux dents intermédiaires à peine indiquées, qui caractérisent les mâles mineurs de *E. tityus*. Il appartient certainement à cette espèce. [Pl. IX, fig. 11, mandibule.]

Eurytrachelus reichei Hope, Proc. Ent. Soc. Lond., 1842, p. 83 : Cat., p. 21.—Trois mâles sont étiquetés comme types à Oxford; ils mesurent 52, 51 et 47 mm. et sont tous trois indiqués de "K. Hills." Un autre spécimen, mesurant 50 mm. porte aussi une étiquette de Hope "*Reichei* Hope" et la localité "Bengal."

Eurytrachelus lineatopunctatus Hope, in Gray, Zool. Miscell., i, 1831, p. 22 : Cat., p. 23.—La description de l'espèce parle de mâles et de femelles. Il n'y a, à Oxford, que des femelles indiquées comme types de cette espèce. Toutes trois paraissent être du Nepaul, deux sont explicitement indiquées de cette provenance. Bien qu'il soit fort difficile de distinguer les femelles de *E. tityus* de celles de *E. reichei*, je considère comme vraisemblable qu'elles se rapportent à cette dernière espèce. Parry les a, au contraire, rapportées à *E. tityus* (Cat., 1864, p. 87). A l'appui de mon opinion vient la description donnée par Hope des mâles venus avec ces femelles : dont la phrase suivante est applicable à *E. reichei*, mais non à *E. tityus* : " mandibulis maris capitis longitudine falcatis dente parvo conico ante medium interdum fere obsoleto . . ."

Eurytrachelus blanchardi Hope, Proc. Soc. Ent. Lond., 1842, p. 84 : Cat., p. 21. Le type mâle, conservé à Oxford, est un *E. reichei* Hope, forme moyenne (et non de forme mineure comme l'a indiqué Parry, Cat., 1864, p. 88).

Eurytrachelus rugifrons Hope, Cat., p. 24.—Comme l'a indiqué Parry (Cat., 1864, p. 87) la femelle type appartient à *E. bucephalus* Perty. Elle porte les indications " *rugifrons* Hope," " *subcostatus* Dup. Java." Une autre femelle est étiquetée " *subcostatus* De Haan." U. O.

Eurytrachelus candezei Parry, Trans. Ent. Soc. Lond., 1870, p. 90, pl. 1, fig. 2. Le type, figuré par Parry, est conservé à Oxford. Parry a reconnu son identité avec *E. eurycephalus* Burmeister (*loc. cit.*, 1874, p. 371). Les curieuses impressions du pronotum sont parfaitement symétriques. On peut les expliquer par la déformation produite par les mandibules d'un autre mâle alors que le premier exemplaire n'était pas absolument solidifié, mais cette hypothèse est discutable. Il arrive assez souvent que les petits mâles et les femelles du *L. cervus* présentent des dépressions symétriques sur le pronotum.

Eurytrachelus chevrolati Hope, Proc. Ent. Soc. Lond., 1842, p. 84 : Cat. p. 20.—Le type est un grand mâle de *E. gypaëtus* Castelnau comme l'a indiqué Parry (qui supposait *E. saiga* identique à ces insectes). C'est un exemplaire de forme assez lourde, avec des mandibules moyennement allongées. Il porte l'étiquette de provenance " Khasyah Hills," s'accordant avec l'indication du descripteur et certainement inexacte. U. O.

Eurytrachelus dubius Hope, Cat., p. 21. Deux mâles types sont conservés à Oxford. Le plus grand mesure 19½ lignes. l'autre 18 lignes (environ 41·5 et 38 mm.). Ce sont des *E. gypaëtus* Cast., de forme moyenne, dont les mandibules portent encore des soies, et non des spécimens de forme mineure. La provenance des deux exemplaires est " Java," contrairement à l'indication de la diagnose.

Eurytrachelus incertus Hope, Cat., p. 22. Deux mâles sont indiqués comme types à Oxford. Ils appartiennent tous deux à la forme moyenne, l'un de *E. gypaëtus* Cast., l'autre de *E. cribriceps* Chevrolat. Le premier est étiqueté "Java," le deuxième, et une femelle placée avec lui, "Manille." Le *gypaëtus* est le plus grand des deux.

Eurytrachelus indeterminatus Hope, Cat., p. 22. C'est un petit mâle de *E. gypaëtus*, appartenant à la forme *capito* Albers. Provenance "Java." U. O. Sous le nom inédit de *Dorcus megacephalus* Gory, est conservé également un autre mâle *capito* plus grand.

Eurytrachelus javanus Hope, Cat., p. 6. Cet insecte, cité, mais non décrit dans le Catalogue, se trouve à Oxford, c'est une femelle de *E. gypaëtus*.

Eurytrachelus moloschus Hope, Cat., p. 21. Trois exemplaires, deux mâles (types) et une femelle, conservés à Oxford. Ce sont des *E. cribriceps*, comme l'a reconnu Parry (Cat. 1864, p. 88). Un mâle et la femelle portent l'indication "I. Phillip. de Cuming MSS.," l'autre mâle "Manille, coll. Miers."

Eurytrachelus submolaris Hope, Cat., p. 23. Le mâle type est conservé à Oxford. C'est un exemplaire de petite taille, qui a été indiqué par Parry comme espèce distincte, dans son premier Catalogue, puis simplement supprimé dans les suivants. Il figure dans le premier sous le nom de *Dorcus submolaris* Hope et le *D. bengalensis* Hope est donné comme étant sa variété mineure. Je reviendrai sur cette deuxième espèce.

Le type du *submolaris* [Pl. IX, fig. 10 mandibule] est un mâle de 31·5 mm. envoyé par Cantor, de l'Assam. C'est un insecte parfaitement distinct de *E. reichei* et de *E. tityus*, mais apparenté à ce dernier. J'ai pu en réunir une vingtaine d'exemplaires dans ma collection; ils sont très homogènes quoique variant de provenance. C'est à cette espèce que se rattache mon *Dorcus brachycerus* (Bull. Soc. Ent. Fr., 1904, p. 27) du Kaschmyr, quoiqu'il ne me paraisse pas identique aux spécimens de l'Assam. Il constitue vraisemblablement une forme locale ou une variété, ce que je ne puis affirmer absolument, n'en ayant que de petits développements. Je possède, au contraire, d'assez grands mâles de *E. submolaris*, mais non encore la forme majeure. Tous les spécimens se distinguent par une forme robuste et ramassée, les élytres sont à peine striées latéralement, même chez les plus petits mâles. Les contours de la tête sont remarquablement arrondis. L'armature mandibulaire des mâles moyens ressemble beaucoup à celle de *E. tityus*, mais la mandibule est plus courte et plus large.

Eurytrachelus (?) *bengalensis* Hope, Cat., p. 22. Le type mâle est conservé à Oxford. C'est un petit spécimen, de la taille d'un petit *Dorcus parallelepipedus* L.; ses élytres sont presque tout à fait dépourvues de strioles qui n'existent que sur les côtes; elles sont assez finement ponctuées; la tête est assez large, les mandibules ont une dent basale simple. Ces caractères suffisent pour prouver que *E. bengalensis* ne peut être *E. reichei* min., puisque les élytres ne sont pas striées; il ne peut être ni *E. tityus* ni *E. submolaris*, comme l'avait supposé Parry (Cat. 1864, p. 89), puisque chez les petits mâles de ces espèces il n'y a pas de dent basale à la mandibule.

Je pense qui si cet insecte est la forme mineure d'une espèce déjà nommée, ce serait plutôt avec *D. glabripennis* Westwood qu'il conviendrait de vérifier ses affinités, mais je ne connais pas, d'une manière certaine, les petits développements de cette rare espèce.

Eurytrachelus wickhami Waterhouse, Ann. Mag. Nat. Hist., 1894, p. 283. Type mâle au British Museum.

Eurytrachelus pilosipes Waterhouse, Trans. Ent. Soc. Lond., 1883, p. 447, pl. 21, fig. 1. Les deux mâles conservés au British Museum, types de l'espèce, rappellent entièrement l'*E. intermedius* Gestro dont ils ne diffèrent que par les mandibules. D'après les spécimens de cette espèce qui ont été reçus plus récemment, elle semble co-exister aux I. Salomon avec l'*E. intermedius.*

Dorcus antaeus Hope, Proc. Ent. Soc. Lond., 1842, p. 83 : Cat., p. 20. Le type est un bel exemplaire mâle de "K. Hills." U. O.

Dorcus mercurius Hope. Sous ce nom, inédit, figurent à Oxford deux petits mâles de l'espèce précédente.

Dorcus scaritoides Hope, Cat., p. 24. La femelle type de cette espèce est un *D. antaeus* Hope de faible taille provenant, comme le mâle, de "K. Hills." Elle porte une étiquette: "*Antaeus* ♀? *tityus* ?" Parry a indiqué, avec doute (Cat., 1864, p. 90), l'identité présumée de *D. scaritoides* et de *D. antaeus.* Il a simplement supprimé cette espèce dans ses deux autres Catalogues.

Dorcus de haani Hope, Trans. Linn. Soc., 1843, p. 106 : Cat. p. 22.—Le musée d'Oxford possède un mâle cotype de cette espèce, et le type femelle. Le mâle est un petit spécimen à élytres striées régulièrement. Il porte les indications : " Khasyah Hills " et " *De Haani* Hope." La femelle a les mêmes étiquettes.

Dorcus curvidens Hope, Trans. Linn. Soc., 1842, p. 589 : Cat. p. 22. Le type est conservé à Oxford. Il porte les indications suivantes : " Assam, S. Jones " " *Curvidens* Hope " " *Antaeus* var. ♂." Cet insecte est un mâle de *D. de haani*, de forme moyenne, avec les côtés des élytres striés. Parry a donné la synonymie : *Curvidens* = *de haani* var. min. (Cat., 1864, p. 88). En réalité, *D. curvidens* est le vrai nom de cette espèce. Non seulement la description du *D. curvidens* est antérieure d'une année à celle du *D. de haani*, mais encore, des deux spécimens décrits, c'est sans aucun doute *de haani* qui appartient à la forme la moins développée. La longueur indiquée pour *D. curvidens* est 21 lignes, celle donnée pour *de haani* est seulement 17 lignes. La description des élytres montre bien d'ailleurs que la différence signalée plus haut entre *D. curvidens* et *D. de haani* cotype existait de même avec *D. de haani* type. Le nom de *de haani* doit, régulièrement, passer en synonymie.

Dorcus glabripennis Westwood, Trans. Ent. Soc. Lond., 1871, p. 359, pl. 8, fig. 6. Le type, conservé au British Museum, ressemble peu à la figure, bien que Westwood ait été, en général, un dessinateur aussi habile qu'exact. Les côtes élytrales sont peu apparentes et les élytres sont, en réalité, assez lisses et brillantes. Un mâle plus petit, étiqueté par Parry " var. minor " de " Khasyah Hills " ressemble à un *E. brachycerus* ou *submolaris*, ses élytres sont brillantes, sans côtes ou stries plus apparentes que chez le type.

Dorcus vicinus Saunders, Trans. Ent. Soc. Lond., 1854, p. 51, pl. 4, fig 9. Type au British Museum, où la femelle se trouve également conservée.

Dorcus suturalis Westwood, Trans. Ent. Soc. Lond., 1871, p. 358, pl. 8, fig. 5. Type mâle au British Museum. Les femelles n'appartiennent pas à cette espèce ; ce sont des femelles de *E. brachycerus*. Le *D. suturalis*, qui a été récemment reçu en assez fortes séries, est apparenté à l'espèce suivante.

Dorcus ratiocinativus Westwood, Trans. Ent. Soc. Lond., 1871, p. 356, pl. 8, fig. 2.—Cette espèce a été reçue en nombre par M. R. Oberthür il y a une douzaine d'années, ce qui a permis de connaître la femelle. Les spécimens ainsi reçus sont, d'une manière générale, plus grands que le type du British Museum, mais lui ressemblent très exactement.

Dorcus rudis Westwood, Trans. Ent. Soc. Lond., 1864, p. 35, pl. 9, fig. 4, *4a–4g*. Le type femelle de cet insecte est conservé au British Museum. *D. rudis* a toujours été un peu une énigme pour les spécialistes. On en reçoit, quoique rarement, des exemplaires isolés. J'en ai vu un à Bruxelles (Museum) et j'en ai réuni quatre dans ma collection. Mais le mâle reste introuvable, soit que nous le connaissions déjà et que nous ne sachions pas reconnaître ses affinités avec sa femelle, soit qu'il n'ait pas encore été envoyé en Europe.

Le dernier catalogue des Lucanides, dû à M. van Roon, me prête une énormité dont je crois être incapable en m'attribuant la synonymie inattendue *D. rudis* = *D. derelictus* Parry. Je ne sais où M. van Roon a trouvé ce renseignement.

Dorcus derelictus Parry, Proc. Ent. Soc. Lond., 1862, p. 112.—Le type est également au British Museum. Comme *D. rudis*, *D. derelictus* a exercé la sagacité des spécialistes, mais je crois que ses affinités sont beaucoup plus certaines et, après avoir examiné le type, je maintiens entièrement l'opinion que j'ai donnée autrefois (Mem. Soc. Ent. Belg. 1902, p. 58) que cet insecte est la femelle d'un Dorcide très voisin de *Macrodorcus rubrofemoratus* Voll. Le spécimen du British Museum est d'un noir franc, avec reflets soyeux, dans le genre des femelles de *Rhaetus westwoodi*. Les pattes antérieures sont cintrées concaves extérieurement. Les fémurs ne sont pas tout à fait noirs, mais ont une faible teinte rougeâtre, l'extrémité des tibias antérieurs est tout à fait du même modèle que chez *M. rubrofemoratus*. J'ai vu deux autres spécimens, qui m'ont été communiqués par M. Möllenkamp et qui ne me paraissent pas différer du type. L'espèce est plus grande que *Macrodorcus* (*Hemisodorcus*) *rubrofemoratus*, mais voisine de cette espèce et de *H. arrowi* Boil.

Macrodorcus opacus, Waterhouse, Ent. Monthly Mag., 1870, p. 208, est bien, comme l'a indiqué Lewis, un mâle de grand développement de *M. striatipennis* Motschulsky. B. M.

Metallactulus parvulus Hope, Cat., p. 25. Les types de Hope conservés à Oxford sont deux femelles, provenance "Manille."

Gnaphaloryx squalidus Hope, Cat., p. 19. Les types, un mâle et une femelle, sont également à Oxford.

Gnaphaloryx sculptipennis Parry, Trans. Ent. Soc. Lond., 1864, p. 52. Le type mâle, qui se trouve au British Museum, est un petit exemplaire.

Eulepidius luridus Westwood, Trans. Ent. Soc. Lond., 1874, p. 357, pl. 3, fig. 1. Le type de ce rare insecte est conservé à Londres. Je pense que sa place est bien à côté des *Gnaphaloryx*, mais ceux-ci ne sont pas correctement classés dans les Dorcides.

Aegotypus trilobatus Parry, Proc. Ent. Soc. Lond., 1862, p. 113. Il a été décrit trois espèces d'*Aegotypus*. L'*Ae. trilobatus* est nettement distinct d'*Ae. armatus* Boil. Il se rapproche beaucoup plus d'*Ae. lobicollis* Jakowleff ou, tout au moins, de l'espèce de Kina-Balu qui est répandue sous ce nom. Le grand mâle d'*Ae. trilobatus* porte une crête frontale bien développée. La saillie antérieure du prothorax est lobée comme chez les exemplaires de Kina-Balu. La femelle est seulement ondulée sur les côtés du prothorax; cette forme varie un peu suivant les spécimens chez *Ae. lobicollis*. L'écart des deux espèces est très faible, s'il existe.

Aegus chelifer MacLeay, Horae Ent., 1819, p. 113.—Le British Museum possède un spécimen qui, d'après Parry (Cat. 1864, p. 54), aurait été envoyé par Mr. MacLeay lui-même, avec l'indication de l'habitat "Australia" sur son étiquette. Parry, dans la note qu'il consacre à cette espèce, identifie ce spécimen avec ceux reçus par Mniszech et lui-même du Cambodge et de la péninsule Malaise.

Au Cambodge existe une assez grande espèce, voisine d'*Ae. acuminatus* Fab. mais ayant les mandibules armées d'une dent toujours simple, assez avancée vers l'apex, et les élytres brillantes sur les côtés. Par contre cette espèce ne semble pas se trouver en Malaisie. Elle a été décrite par Jakowleff, sous le nom d'*Aegus specularis* (Horae Soc. Ent. Ross., 1900, p. 633). Une autre espèce, plus petite. répond également à la description donnée par Parry dans sa note. Elle diffère davantage que la précédente d'*Aegus acuminatus*, et a les intervalles des élytres bombés au lieu d'être plats. La distribution géographique semble assez large. Bornéo, Malacca, sont ses provenances les plus certaines. Quelques exemplaires sont indiqués de Java, sans grande certitude, et de Sumatra. J'ai décrit cette espèce sous le nom d'*Aegus nitidus* (Bull. Soc. Ent. Fr., 1899, p. 321), pensant, d'après la provenance : "Cambodge" que le véritable *Aegus chelifer* devait être la grande espèce indo-chinoise. L'examen du spécimen cotype d'*Aegus chelifer*, conservé au British Museum, montre immédiatement que c'est à cette dernière espèce qu'il se rapporte. L'insecte porte les indications suivantes : "*Aegus chelifer* MacLeay," "Australasia, 1736," "Chelifer, 1736." Ce spécimen se rapproche davantage de ceux reçus de Singapore que de ceux reçus de Bornéo. Sans discuter l'indication "Australasia" qui reste douteuse, nous devons considérer ce cotype comme vraisemblablement correct et mettre l'*Ae. nitidus* en synonymie.

Aegus platyodon Parry, Proc. Ent. Soc. Lond., 1862, p. 112.—Le type (British Museum) de cette espèce est un assez grand mâle, provenant de Gilolo, par Wallace. Cette espèce varie un peu suivant les localités. Le type a le pronotum assez brillant, le dessous du menton et le sous-menton sont couverts d'une ponctuation cicatricielle confluente.

Aegus blandus Parry, Trans. Ent. Soc. Lond., 1864, p. 57. Le type mâle, conservé au British Museum est, je crois, toujours l'unique exemplaire connu. C'est un insecte d'aspect très distinct, allongé, avec une grosse tête et de courtes mandibules simples, armées d'une dent basale également simple ; les intervalles des élytres sont plats, lisses mais peu brillants, le pronotum assez brillant.

Aegus woodfordi Waterhouse, Ann. Mag. Nat. Hist., 1890, p. 38. Types mâle et femelle au British Museum. Le mâle est un petit exemplaire. Les mâles majeurs de cette espèce ont un aspect assez différent. Les mandibules sont toujours velues en dessous.

Aegus glaber Parry, Trans. Ent. Soc. Lond., 1864, p. 59. Le type est un très petit mâle. B. M.

Aegus curtisi Waterhouse, Ann. Mag. Nat. Hist., 1890, p. 36. Type au British Museum. Est apparenté à *Ae. oxygonus* Jakowleff, mais distinct.

Aegus parryi Waterhouse, Ann. Mag. Nat. Hist., 1890, p. 37. Cette espèce est représentée par trois spécimens, qui viennent de la collection Parry et sont, vraisemblablement, d'origines distinctes. Il y a au moins deux espèces différentes sous le même nom.

Le plus grand mâle doit être considéré comme le vrai type ; il a les mandibules terminées par un biseau vertical, la dent basale est bien détachée, oblique, et obliquement coupée, de sorte qu'elle forme un angle obtus vers la mandibule à laquelle elle appartient et un angle aigu à son extrémité, du côté de l'autre mandibule. Cette forme rappelle beaucoup celle des mandibules de l'*Aegus hopei* Boil., et les deux espèces sont certainement très voisines, sinon identiques, ce que je ne puis affirmer, n'ayant pu comparer les types et n'ayant rapporté qu'un croquis de l'*Ae. parryi.* [Pl. IX, fig. 15, mandibule.] Celui-ci est indiqué de Sarawak. *Hopei* est de Palembang.

Le deuxième exemplaire me semble identique à mon *Ae. westwoodi*; il en a la dent basale simple et la forte carène apicale des mandibules. [Pl. IX, fig. 16, mandibule.] Le troisième exemplaire, d'après un croquis envoyé autrefois à M. Ritsema, qui me l'avait communiqué, était un petit spécimen avec mandibules aiguës à la pointe et dent basale simple, comme les ont les petits spécimens d'*Ae. malaccus* Thomson. Ce type était réduit à l'état de débris lorsque je l'ai vu en nature. B. M.

Aegus roepstorffi Waterhouse, Ann. Mag. Nat. Hist., 1890, p. 36. Les types, conservés au British Museum, sont des Iles Andamans. La même espèce existe aux Iles Nicobar.

Aegus subnitidus Waterhouse, Ent. Monthly Mag., 1873, p. 277. Le type est un petit mâle à dent basale aiguë. B. M.

Aegus kandiensis Hope, Cat., p. 6 : Parry, Trans. Ent. Soc. Lond., 1870, p. 61, pl. 2, figs. 5–8. Cette espèce, que Parry a bien voulu considérer comme attribuable à Hope, qui l'a simplement nommée, et à tort, comme un synonyme d'*Ae. cicatricosus* Wied, lui-même forme mineure d'*Ae. acuminatus* Fab., a été, en réalité, décrite par Parry dans son deuxième Catalogue. Le vrai type doit donc être considéré comme étant le grand mâle figuré à cette occasion ; il fut acquis par H. Deyrolle à la vente de la collection ; peut-être se trouve-t-il actuellement dans la collection de M. R. Oberthür.

L'insecte nommé par Hope est conservé à Oxford; c'est un petit mâle, provenance " Kandy." Le pronotum est ponctué et brillant, la dent basale des mandibules est simple.

Aegus parallelus Hope, Cat., p. 22. Le type est conservé à Oxford, il m'a été communiqué et j'ai pu l'examiner avec soin. C'est certainement un petit spécimen appartenant, soit à *Aegus labilis* Westwood, soit à *Aegus platycephalus* Westwood. En raison de la provenance : " Khasyah Hills " il convient de la rapporter à la première de ces deux espèces et, en raison des dates de description le nom de *parallelus* doit faire passer en synonymie le nom de *labilis*. Westwood a d'ailleurs lui-même admis que *Ae. parallelus* était la forme mineure d'*Ae. labilis* et que *Ae. aequalis* Westwood était très probablement identique à *Ae. parallelus*. (*Vide* Trans. Ent. Soc. Lond., 1864, p. 56.)

Aegus eschscholtzi Hope, Cat., p. 22. Le type mâle appartient au développement maximum. Son étiquette de provenance semble indiquer Java, contrairement à la diagnose qui donne "Tenasserim." U. O.

Aegus striatus Hope, non décrit, est representé à Oxford par un petit mâle d'*Aegus acuminatus* sans indication de provenance.

Aegus fronticornis Hope, également non décrit, est un mâle moyen, provenance "Kandy," d'*Aegus kandiensis* Parry. U. O.

Aegus punctiger Saunders, Trans. Ent. Soc. Lond., 1854, p. 54, dont le type existe à Oxford est, comme l'a indiqué Parry (Cat. 1864, p. 92) la femelle d'*Ae. laevicollis* Saunders.

Alcimus dilatatus Fairmaire, Rev. Zool. 1849, p. 416, pl. 11, fig. 6. M. Waterhouse a décrit la grande forme de cette espèce, dont le type de Fairmaire est un petit spécimen. Le grand mâle, qui faisait partie de la collection Parry est maintenant conservé au British Museum. [Pl. IX, fig. 3.]

Paraegus listeri Gahan, Proc. Zool. Soc., 1888, p. 539. Types mâles et femelles au British Museum. Cette espèce ressemble aux *Aegus lansbergei* et *rotundatus* Boil., et rappelle également certains *Lissotes*.

Apterocyclus honoluluensis Waterhouse, Trans. Ent. Soc. Lond., 1871, p. 315, fig. ♀. Le croquis publié avec la description ne permet pas de se rendre compte de l'aspect de l'insecte, qui ressemble assez à un *Sclerostomus*, de la taille du *S. bacchus*. M. Sharp a publié les descriptions de plusieurs autres espèces dont j'ai vu les spécimens, et qui, à ce qu'il m'a semblé, sont vraiment bien voisines les unes des autres. B. M.

Sclerostomus fairmairei Parry, Trans. Ent. Soc. Lond., 1864, p. 61, type mâle. B. M.

Sclerostomus philippii Westwood, Trans. Ent. Soc. Lond., 1864, p. 61, pl. 11, fig. 5. Types mâle et femelle. Le mâle est un exemplaire moyen. La dent basale tridentée s'atténue beaucoup chez les spécimens de plus grand développement.

Sclerostomus buckleyi Waterhouse, Ann. Mag. Nat Hist., 1886, p. 497. Les femelles, indiquées comme types n'appartiennent pas, à mon avis, à la même espèce que le mâle; elles sont très courtes et larges, ternes, d'une couleur rougeâtre nuancée de noir, avec des strioles et non des stries régulières comme celles du mâle; il y a un angle postérieur épineux très net au prothorax qui n'existe nullement chez le mâle; je ne serais pas éloigné de penser que ces femelles appartiennent au genre *Aegognathus* Leuthner.

Sclerostomus darwini Hope, Ann. Mag. Nat. Hist., 1845, p. 302 : Cat., p. 25. Type mâle conservé à Oxford; paraît être, comme l'a indiqué Parry, *S. femoralis* Guérin, mais n'est pas un grand exemplaire.

Sclerostomus rubripes Hope, Cat., p. 26. La provenance du type mâle est " Magellan," c'est un *S. femoralis* de faible développement. (Parry, Cat. 1884, p. 95.) U. O.

Sclerostomus variolosus Hope, Cat., p. 25. Les types d'Oxford se rapportent bien au *S. caelatus* Blanchard, comme l'a indiqué Parry (Cat., 1864, p. 95).

Sclerostomus bacchus Hope, Cat., p. 26. Type mâle, conservé à Oxford.

Sclerostomus ditomoides Westwood, Trans. Ent. Soc. Lond., 1855, p. 208, pl. 11, fig. 4. La synonymie indiquée par Parry, Trans. Ent. Soc. Lond., 1870, p. 96, ne me paraît pas certaine. Il semble d'ailleurs que Parry ait eu lui-même des doutes à ce sujet, puisque, dans son Catalogue de 1875 il a rétabli, quoique avec doute, *S. neotragus* Westwood = *ditomoides* Westwood (*teste* Parry) comme une espèce distincte de *S. cruentus* Burmeister. U. O.

Scortizus irroratus Hope, Trans. Zool. Soc. Lond., 1835, p. 100, pl. 14, fig. 3. L'insecte conservé comme type à Oxford est un mâle de cette espèce, le vrai type doit être une femelle.

Scortizus costatus Hope, Cat. p. 27. Types mâle et femelle. U. O.

Aegognathus Waterhousei, Leuthner, Trans. Ent. Soc. Lond., 1883, p. 445, pl. 21, fig. 3. La figure qui a été donnée de cet insecte est bonne, mais les mandibules sont dans une position anormale qui en change l'aspect. Les élytres ont l'apparence pruineuse de celles de certains *Sclerostomus*, mais la forme de l'extrémité des tibias, étroite et peu épineuse chez *Aegognathus*, éloigne ces deux genres et rapproche plutôt le dernier des *Auxicerus*, tout en restant très distinct. L'extrémité des mandibules est coupée en biseau un peu élargi en spatule, avec une trace de denticule anté-apical. B. M.

Charagmophorus lineatus Waterhouse, Ann. Mag. Nat. Hist., 1895, p. 495. Type mâle au British Museum. [Pl. IX, fig. 2.]

Auxicerus platyceps Waterhouse, Ann. Mag. Nat. Hist. 1883, p. 387. Le type est un insecte très gracile, c'est un mâle de développement moyen. Les mandibules portent une trace de la dent d'arrêt placée sur la partie supérieure, un peu au delà du milieu. B. M.

Platycerus caucasicus Parry, Trans. Ent. Soc. Lond., 1864, p. 60. Le type mâle est conservé au British Museum.

Pseudodorcus hydrophiloides Hope, Cat., p. 23. Le mâle de cette espèce énigmatique est conservé à Oxford, la femelle au British Museum. Cet insecte est resté extrêmement rare jusqu'à présent, et peu connu. Le mâle [Pl. IX, fig. 1–1*a*, antenne] a tout à fait l'aspect d'une grosse femelle d'*Eurytrachelus* du groupe de *E. intermedius*, mais plus large, et avec des mandibules beaucoup plus compliquées. La femelle a la même taille que le mâle, mais la tête est un peu plus petite et les mandibules présentent une dent simple vers l'apex. Celles du mâle sont sensiblement égales à la longueur de la tête; elles sont convexes extérieurement, leur pointe est simple; il existe une dent basale double à gauche, simple et projetée vers l'avant à droite, et une dent médiane double placée un peu plus bas à droite qu'à gauche. Le front est concave et brillant, l'épistome forme une saillie conique dont la forme est celle d'une accolade à pointe assez développée, la partie qui avance est en relief sur le reste. L'antenne est bien coudée et ressemble beaucoup à celle d'un grand Dorcide. Le scape est sensiblement égal au fouet. Le 2^e article est plus long que le 3^e; celui-ci est égal au 5^e et plus long que le 4^e; le 6^e et le 7^e sont égaux au 5^e. Le 7^e est éperonné, l'éperon est conique et porte des soies courtes; les trois derniers ont leur surface feutrée, mais le 8^e a toute la région dorsale, et le 9^e la partie apicale de cette région, brillantes. Le peigne est bien développé.

Les canthus ne coupent pas plus du tiers antérieur de l'œil; celui-ci est gros, sphérique, un peu plus développé en dessous. Le menton est petit, trapézoïdal, avec les angles bien arrondis et le bord antérieur convexe. Il est brillant, avec une forte ponctuation cicatricielle.

Le prosternum est en carène saillante, aplatie, avec deux impressions distinctes avant le milieu des hanches; il forme ensuite une pointe conique dont les génératrices sont un peu convexes. Le mésosternum est concave. Le métasternum est lisse, un peu déprimé en triangle vers les hanches postérieures.

Les pattes sont assez fines; les tibias antérieurs sont dentés et denticulés en scie entre les dents principales. La fourche apicale est peu caractérisée. Les tibias médians et les postérieurs ont une forte épine aiguë avant le milieu. Les tarses sont assez grêles, plus courts que les tibias, le dernier article a deux fois et demie la longueur d'un des autres. Les soies inférieures sont disposées en deux pinceaux, moins fournis vers le dernier article.

Ce qui sépare le plus nettement, au premier examen, cet insecte des grand Dorcides auxquels on serait tenté de le réunir, c'est la forme de la lèvre supérieure et l'armature compliquée de ses courtes mandibules. A ce point de vue, il se rapproche davantage des Cladognathides. Mais la disposition des pattes, au contraire, avec les fortes épines apicales, rappelle davantage les Dorcides.

J'ai reçu, il y a quelque temps, sans provenance précise, mais venant presque certainement du Queensland, un spécimen de *Pseudodorcus* qui diffère de *P. hydrophiloides* par la dent basale des mandibules qui est double à droite et à gauche, et la dent médiane, qui est simple; son aspect est tout à fait analogue à celui du mâle de l'Ile Melville, mais il est un peu plus petit.

Je n'ai pu examiner la femelle du *P. hydrophiloides*, décrite par Westwood sous le nom de *carbonarius* (Trans. Ent. Soc. Lond., 1863, p. 515, pl. 21, fig. 3) avec autant de soin que le mâle, ce dernier m'ayant été très obligeamment communiqué. Elle me paraît bien, comme l'a reconnu Parry (Trans. Ent. Soc. Lond., 1870, p. 94) appartenir à la même espèce. La figure donnée par Westwood (*loc. cit.*) ne ressemble pas à l'insecte; elle est exacte comme détails, mais la position réelle de la tête est inclinée, de sorte qu'elle est peu visible et que la forme générale paraît presque régulièrement elliptique.

Lissapterus howittanus Westwood, Trans. Ent. Soc. Lond., 1863, p. 513, pl. 21, fig. 1, ♂. Le musée d'Oxford possède deux mâles et deux femelles, types de l'espèce.

Lissapterus pelorides Westwood, Trans. Ent. Soc. Lond., 1855, p. 220. La femelle type, seul spécimen connu de cette espèce, est conservée au British Museum; le dessin qu'en a donné Westwood (*loc. cit.*, 1863, p. 514, pl. 21, fig. 2) est très exact. L'insecte est noir et lisse, à peu près comme une femelle de *Dorcus antaeus* Hope, et très distinct de *L. howittanus*.

Lissotes helmsi Sharp, Ent. Monthly Mag., 1881, p. 49, type ♂. B. M.

Lissotes capito H. Deyrolle, Trans. Ent. Soc. Lond., 1873, p. 339, pl. 5, fig. 4, ♂ : Parry, *loc. cit.*, p. 339, pl. 5, fig. 5, ♀. Les spécimens du British Museum ne sont pas les types, mais sont intéressants à comparer a l'espèce la plus voisine, *L. helmsi*, les exemplaires de *L. capito* étant fort rares. Le British Museum possède deux mâles et trois femelles. L'espèce est à peine inférieure à *L. helmsi* comme taille. La dent basale pointue des mandibules, qui est latérale chez *L. helmsi* est supérieure chez *L. capito*. Les intervalles des élytres sont plus serrés chez ce dernier et les tibias postérieurs portent une épine qui fait défaut à *L. helmsi*.

Lissotes forcipula Westwood, Trans. Ent. Soc. Lond., 1871, p. 366, pl. 9, fig. 2. Petite espèce, très courte et arrondie. Je serais très disposé à croire que la suivante, dont le type est une femelle, n'en diffère pas réellement. B. M.

Lissotes subcrenatus Westwood, Trans. Ent. Soc. Lond., 1871, p. 368, pl. 9, fig. 5. Le type femelle, originaire de Tasmanie, comme l'insecte précédent, et paraissant apparentée avec lui. B. M.

Lissotes crenatus Westwood, Trans. Ent. Soc. Lond., 1855, p. 216, pl. 12, fig. 3. Le musée d'Oxford possède un mâle et une femelle indiqués comme types. Le mâle appartient à la forme majeure et correspond bien à la description.

Quant à la femelle, qui n'est nullement mentionnée dans la description de l'espèce, je suis disposé à penser que c'est celle décrite plus tard par Westwood sous le nom de *L. forcipula?* ♀. Trans. Ent. Soc. Lond., 1871, p. 367, pl. 9, fig. 6, *a*, *b*. Elle correspond exactement à cette description et aura sans doute été identifiée postérieurement par Westwood avec *L. crenatus?* Il est bien certain que les *L. crenatus*, *subcrenatus*, *forcipula* constituent un petit groupe qu'il serait nécessaire de revoir avec soin. Malheureusement, ces espèces sont très mal représentées dans nos collections et nous ignorons l'étendue et la genre de leurs variations spécifiques.

M. A. M. Lea a récemment publié une intéressante étude sur le genre *Lissotes*,* dans laquelle il examine et figure les espèces australiennes et tasmaniennes dont il a eu connaissance, mais il ne fait que citer *L. crenatus* et *L. subcrenatus* d'après les descriptions originales.

Lissotes latidens Westwood, Trans. Ent. Soc. Lond., 1871, p. 363, pl. 9, fig. 4. Le type mâle de cette rare espèce est conservé à Oxford. Il est très distinct et bien caractérisé.

Lissotes launcestoni Westwood, Trans. Ent. Soc. Lond., 1871, p. 365, pl. 9, fig. 1. Le type se trouve au musée d'Oxford. Il n'est pas explicitement indiqué mais je pense que c'est le spécimen, de taille moyenne et de forme assez étroite, qui porte les étiquettes anciennes : "*Lissotes launcestoni* Westw^{d} Howitt" "Lissotes n. sp ? Tasmania, March 1866 two ♂" et "W. Dr. Howitt. N.H." Il existe d'autres spécimens, dont un grand mâle, mais ils ne correspondent pas à la figure. Cette espèce est bien connue et l'une des plus répandues dans les collections.

Lissotes cancroides Fabricius, Mant., i, 1787, p. 2. D'après Westwood, le type même de l'espèce, décrit par Fabricius, fait partie des collections du British Museum. Je ne l'ai pas vu ; aucun des *L. cancroides* ne portait d'indication de type. Dans la collection d'Oxford, le spécimen étiqueté *L. cancroides*, qui m'a été communiqué, porte les indications : "*Cancroides* ♂ Mus. Hope" et une étiquette qui paraît très ancienne : "Van D. Land. Mr. Richard." Cet insecte ressemble beaucoup à un autre *Lissotes*, qui est étiqueté *Lissotes curvicornis* et m'a également été envoyé. Ce dernier porte les indications : "*Lissotes cancroides* Fab. Mount Wellington Tasmania, March 1866, ♂ and ♀"—"*L. curvicornis* Boisd. sec. type sp. Mus. Paris"—"W. Dr. Howitt. N.H."

La femelle existe également, avec les étiquettes : "♀. *cancroides*" "*L. curvicornis*" "W. Dr. Howitt. N.H."

Ces divers spécimens appartiennent sans aucun doute à la même espèce et sont des *L. curvicornis* Boisduval.

Lissotes subtuberculatus Westwood, Trans. Ent. Soc. Lond., 1855, p. 215, pl. 12, fig. 2. Le couple de cette espèce, possédé par le musée d'Oxford, peut être considéré comme typique, mais le type véritable se trouvait unique dans la collection Chevrolat. Ces spécimens ont exactement les mêmes indications de provenance que les deux *Lissotes curvicornis* mentionnés ci-dessus. Ces insectes sont d'ailleurs très étroitement apparentés et M. A. M. Lea, dans son travail, considère *L. subtuberculatus* comme une simple variété de *L. curvicornis.*

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* Notes on the Genus *Lissotes*, with descriptions of New Species, by Arthur M. Lea, F.E.S., Government Entomologist. Proc. Royal Soc., Tasmania, 1910, pp. 346–366, pl. viii, ix.

Oonotus adspersus Boheman, Ins. Caffr., ii., 1848, p. 384. La femelle, décrite par Westwood (Trans. Ent. Soc. Lond., 1863, p. 455, pl. 16, fig. 6) est conservée au British Museum, A défaut des exemplaires décrits par Boheman, on peut la considérer comme type. Avec cette femelle sont une autre femelle et un mâle, tous trois ayant fait partie de la collection Parry. Le mâle a la tête sensiblement plus large et les canthus plus développés; il est un peu plus grand et plus large.

Nigidius cribricollis Parry, Trans. Ent. Soc. Lond., 1873, p. 340, pl. 5, fig. 6, type. B. M.

Nigidius divergens Waterhouse, Ann. Mag. Nat. Hist., 1890, p. 38. Forte espèce, de la taille du *N. beningseni* Kraatz, aisément reconnaissable à la fossette longitudinale du pronotum et à quatre impressions bien marquées le long du bord antérieur incliné. Type. B. M.

Nigidius welwitschi Waterhouse, Ann. Mag. Nat. Hist., 1890, p. 39, type. B. M.

Nigidius distinctus Parry, Trans. Ent. Soc. Lond., 1873, p. 341, pl. 5, fig. 7, type. B. M.

Nigidius formosanus Bates, Proc. Zool. Soc. Lond., 1866, p. 347 type. B. M.

Nigidius obesus Parry, Trans. Ent. Soc. Lond., 1864, p. 63 type. B. M.

Nigiduis parryi Bates, Proc. Zool. Soc. Lond., 1866, p. 347. Le type n'est probablement pas un spécimen de la plus grande taille. Il ne présente aucune différence valable avec le *N. gigas* du Tonkin, décrit par M. Möllenkamp. *N. parryi* a seulement la tête un peu plus plate sur la partie antérieure, avec deux très légères impressions qui ne se remarquent pas sur un *N. gigas* de même taille pris comme exemplaire de comparaison. *N. gigas* me paraît être, tout au plus, une sous-variété de *N. parryi.* B. M.

Nigidius integer Westwood. Ent. Mag., 1838, p. 265. Cet insecte est conservé à Oxford. La synonymie : = *bubalus* Swederus a été donnée par Parry (Cat. 1864, p. 98).

Nigidius forcipatus Westwood, Ent. Mag., 1838, p. 267. Le type est un petit exemplaire de *N. laevicollis* Westwood. Le bord antérieur du pronotum est entièrement dépourvu de tubercule médian et il n'y a aucune fossette sur le disque;

les canthus oculaires et la dent supérieure de la mandibule sont moyennement développés. L'absence de tubercule médian au pronotum et la forme des canthus indiquent que cet exemplaire doit être une femelle. U. O.

Nigidius laevicollis Westwood, Proc. Zool. Soc. Lond., 1835, p. 128. Le type, également conservé à Oxford, est un assez grand exemplaire, plus développé comme mandibules et canthus que le précédent et possédant un petit tubercule médian à la marge antérieure du pronotum. C'est très probablement un mâle.

Je me suis assuré, sur un bon nombre d'exemplaires de cette espèce, que les mâles avaient toujours un tubercule médian au milieu du bord antérieur du pronotum et que les femelles en étaient dépourvues. Le *N. taurus*, décrit par Jakowleff, dont la distinction du *N. laevicollis* est basée sur le développement des canthus et des mandibules et sur la présence de ce tubercule qui, suivant Jakowleff, manque au *N. laevicollis* (ce que nous venons de reconnaître inexact), me paraît être simplement le mâle de cette espèce; ce nom doit passer en synonymie.

Nigidius trilobus Westwood, Ent. Mag., 1838, p. 263. Le type est conservé au British Museum. Cet insecte est certainement un *Figulus.*

Nigidius grandis Hope, Ann. Mag. Nat. Hist., 1841, p. 302. Cat., p. 26.—Le type est indiqué de Sierra Leone. C'est un exemplaire de taille moyenne. Cette espèce varie un peu comme sculpture du pronotum, mais est toujours facile à reconnaître. U. O.

Figulus binodulus Waterhouse, Ent. Monthly Mag., 1872, p. 277, type. B. M.

Figulus punctatus Waterhouse, Ent. Monthly Mag., 1872, p. 278, type. B. M.

Figulus rossi Gahan, Monogr. Christmas Isl., 1900, p. 96, type. B. M.

Figulus regularis Westwood, Ann. Sc. Nat., 1834, p. 120. Le type, conservé à Oxford, est un grand exemplaire. L'espèce semble très commune; c'est à elle que se rapportent le plus grand nombre des exemplaires reçus d'Australie.

Figulus sulcicollis Hope, Cat., p. 26. Cette espèce est peu connue, elle est décrite de Port Essington et paraît être beaucoup plus rare dans les collections. Ayant pu comparer à loisir les deux types, je crois devoir indiquer quels sont les caractères qui permettent de les distinguer.

F. sulcicollis a la tête un peu plus anguleuse en avant; les canthus sont plutôt coudés que régulièrement arrondis, soit en avant, soit en arrière. Le milieu du disque céphalique est lisse chez cette espèce, il est ponctué, surtout au bord frontal, chez *F. regularis.*

Le prothorax a à peu près la même forme, mais est sensiblement plus long chez *sulcicollis.* Le milieu du disque porte une véritable fossette avec des points enfoncés au lieu d'une série de points enfoncés chez *regularis.* Les points s'avancent jusque près de la saillie anguleuse du bord antérieur chez *regularis*, ils en restent éloignés, comme le sillon lui-même, chez *sulcicollis.*

La ponctuation générale est plus fine chez ce dernier. Les élytres ne paraissent pas différer beaucoup, mais l'angle huméral est épineux chez *regularis* et seulement assez aigu chez *sulcicollis.*

Les mandibules de ce dernier sont plus fortes, plus horizontales, moins ponctuées sur le côté externe, celles de *regularis* sont vraiment relevées à l'extrémité.

Les tibias antérieurs sont plus larges, avec la fourche plus longue chez *regularis.*

Les deux types de *F. sulcicollis* sont conservés à Oxford. Les exemplaires qui se rapprochent le plus de ces spécimens, dans les collections modernes, sont des *Figulus* du Queensland, qui ont sensiblement même forme, mais sont bien plus fortement ponctués.

Figulus subcastaneus Westwood, Ent. Mag., 1838, p. 263. C'est une petite espèce qui, comme aspect général, ressemble beaucoup au *F. marginalis* Ritsema. Il s'agit, en réalité, d'une espèce voisine mais distincte. La tête porte une bosse centrale médiane entre les yeux et le prothorax est notablement plus court, à peu près aussi large que long, avec les angles postérieurs et antérieurs arrondis. La fossette du pronotum est linéaire, ponctuée à deux rangées; elle n'atteint pas la marge antérieure, qui n'est pas tuberculée au milieu, et rejoint au contraire la postérieure. Les élytres sont remarquablement longues, striées finement, les intervalles lisses et presque plats, les stries régulièrement ponctuées. U. O.

Figulus manillarum Hope, Cat., p. 26. Le type est conservé au musée d'Oxford.

Figulus ebenus Westwood, Ann. Sc. Nat., 1834, p. 120, pl. 7, fig. 4. Le type est un grand exemplaire de Madagascar, dont les stries latérales des élytres sont bien marquées.

C'est une des formes locales du *F. sublaevis* qui est assez variable comme sculpture des élytres. U. O.

Figulus nigritus Westwood, Ent. Mag., 1838, p. 161. Le type est un exemplaire du Sénégal, plus petit que le précédent; les stries latérales des élytres sont un peu moins prononcées. C'est une autre forme du *F. sublaevis*. U. O.

Cardanus sulcatus Westwood, Ann. Sc. Nat., 1834, p. 113, pl. 7, fig. 1. Le type, conservé à Oxford, est un exemplaire de grande taille.

Cardanus cribratus Parry, Trans. Ent. Soc. Lond., 1870, p. 98. Le type, conservé au British Museum, ressemble à un *C. sulcatus* de grandeur réduite à moitié. C'est un insecte d'un noir terne dont le prothorax a une forme plus simple que celle du *C. sulcatus*. La fovéole médiane est grande, peu profonde, à bords assez larges, formant fer à cheval ouvert en arrière. La dent des mandibules est très faible.

Hexaphyllum westwoodi Hope, Proc. Ent. Soc. Lond., 1840, p. 11. Le mâle et la femelle de Nouvelle Grenade, qui sont les types de Hope, sont conservés à Oxford. La synonymie de cette espèce et de *H. aequinoctiale* Buquet a été indiquée par Burmeister (Handb. v, p. 332).

H. aequinoctiale n'est pas une espèce répandue dans les collections, on peut la considérer comme rare. Les spécimens d'Oxford se distinguent de *H. schuberti* Perty par le pronotum entièrement ponctué, moins bombé, avec une dépression longitudinale médiane moins marquée; par les nervures élytrales étroites et ponctuées, et surtout par la forme des mandibules dont la dent latérale interne est beaucoup plus forte et la deuxième dent supérieure, à partir de la base, bien plus voisine de l'extrémité apicale.

Hexaphyllum brasiliense Gray in Griff. Anim. Kingd., Ins. i, 1832, p. 536, pl. 46, fig. 4. Un mâle et deux femelles, indiqués comme types de "*H. brasiliense* Gray = *Psilodon schuberti* Perty" sont conservés à Oxford. Ce sont trois exemplaires de grandes dimensions de l'espèce que l'on trouve habituellement dans les collections.

Aesalus neotropicalis Bates, Biol. Cent.-Amer., Col. ii, 1886, p. 2, pl. 1, figs 3, 3*a*. Plusieurs exemplaires types, provenance : " Guatemala City." B. M.

Aesalus smithi Bates, Biol. Cent.-Amer., Col. ii, 1886, p. 382. Un seul exemplaire type, provenance : " Chilpancingo, Guerrero, 4,000 ft., June. B. M.

Mitophyllus marmoratus Waterhouse, Ent. Monthly Mag., 1874, p. 8. Le type du British Museum porte l'annotation " Specimen of *M. marmoratus* sent to Oberthür agrees with type of *M. parryanus* sec. Oberthür," d'après laquelle cette espèce devrait passer en synonymie.

Ceratognathus rufipennis Westwood, Trans. Ent. Soc. Lond., p. 82 pl. 2, fig. 2. Le type est conservé au British Museum. La figure donnée par Westwood n'est pas très bonne.

Ceratognathus niger Westwood, Ent. Mag., 1838, p. 261, fig. Le type, conservé à Oxford, est un fort mâle. Les pièces de la bouche ont été disséquées et conservées avec l'insecte.

Ceratognathus abdominalis, Parry, Trans. Ent. Soc. Lond., 1870, p. 99. La description de cet insecte paraît le rapprocher de *C. froggatti* Blackburn. En réalité, le type, qui existe au British Museum, appartient à une petite espèce bien distincte.

Ceratognathus areolatus Westwood, Trans. Ent. Soc. Lond. 1863, p. 430, pl. 14. fig. 2. L'exemplaire femelle, conservé à Oxford, qui sert de type à cette espece, a été rapporté par Parry au *C. helotoides* Thomson. Le *C. helotoides* étant de Nouvelle Zélande et la *C. areolatus* étant, d'après ses étiquettes de provenance, de Nouvelle Hollande, bien que décrit de Nouvelle Zélande, il était intéressant de vérifier la synonymie proposée, d'autant plus qu'il existe, en Australie, une espèce assez voisine comme aspect du *C. helotoides*, le *C. gilesi* Blackburn. Après un examen attentif il n'y a pas de doute pour moi que *C. areolatus* est bien la femelle de *C. helotoides*. Il reste à expliquer pourquoi l'insecte porte une étiquette " W. D$^{r.}$ Howitt N.H.," celle-ci a probablement été mise par erreur à la réception de ce spécimen, car *C. helotoides* n'a pas, jusqu'ici, été signalé d'Australie.

TYPES OU SPÉCIMENS TYPIQUES APPARTENANT AU BRITISH MUSEUM ET AU MUSÉE DE L'UNIVERSITÉ D'OXFORD ÉTUDIÉS OU CITÉS DANS LA NOTE PRÉCÉDENTE.

NOTA.—Les noms des espèces non-valables sont indiqués en italique. Les espèces pour lesquelles une modification est proposée dans la nomenclature sont indiquées par un astérisque.

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EXPLANATION OF PLATE IX.

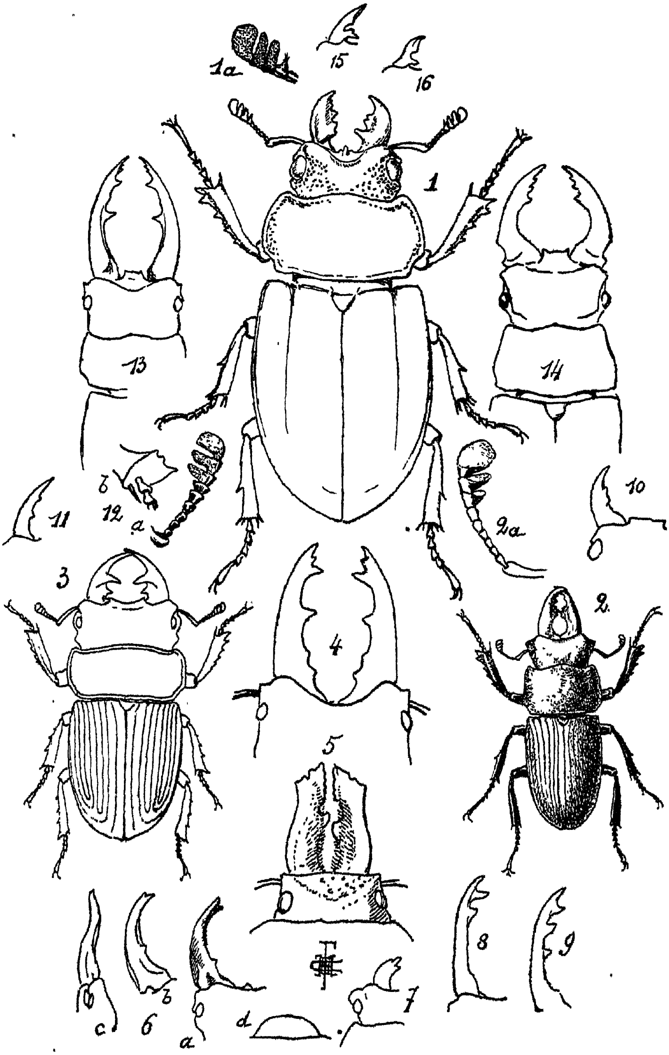
[*See Explanation facing the* PLATE.]

[LÉGENDE DE LA PLANCHE.]

EXPLANATION OF PLATE IX.

FIG. 1. *Pseudodorcus hydrophiloides* Hope, ♂. 1*a*. antenne.
2. *Charagmophorus lineatus* Waterhouse, ♂. 2*a*. antenne.
3. *Alcimus dilatatus* Fairmaire, ♂.
4. *Leptinopterus melanarius* Hope, ♂, mandibules.
5. *Lamprima latreillei* var. *coerulea* Donovan, ♂, mandibules.
6. *Prosopocoelus spencei* Hope, ♂, mandibules vues par dessus (*a*), par dessous (*b*), de côté (*c*); menton (*d*).
7. *Oonotus adspersus* Boheman, ♂, tête.
8. *Prosopocoelus quadridens* Hope, ♂, mandibule.
9. *Prosopocoelus sayersi* Hope, ♂, mandibule.
10. *Eurytrachelus submolaris* Hope, ♂, mandibule.
11. *Eurytrachelus punctilabris* Hope, ♂, mandibule.
12. *Aulacostethus archeri* Waterhouse, ♂, *a*. antenne, *b*. extrémité du tibia postérieur.
13. *Psalidoremus motschulskyi* Waterhouse, ♂.
14. *Lucanus* sp. ? = *ibericus* Motschulsky nec *Akbesiana* Planet.
15. *Aegus parryi* Waterhouse, ♂, type, mandibule.
16. *Aegus parryi* Waterhouse, ♂ = *Ae. westwoodi*, Boileau.

Trans. Ent. Soc. Lond., 1913, Plate IX.



C. Hentschel.

DETAILS OF LUCANIDAE

Reprinted from "The Entomologist's Monthly Magazine," 3rd Series, Vol. III.

NOTES ON THE *COLEOPTERA* RECORDED FROM "RESIN ANIMÉ" BY THE REV. F. W. HOPE.

BY G. C. CHAMPION, F.Z.S.

In the Magazin de Zoologie, 1842, pls. 87 89, the Rev. F. W. Hope described and figured three beetles found in "Resin Animé," no localities being given for any of them, nor any particulars as to the source of the resin itself, except the statement that one of the insects, *Monomma resinorum*, was perhaps from Mauritius—*Hab.: Forsitan in "Insula Cernensi.*" A whole coloured plate was given for each beetle, all drawn by Westwood, and details of structure added. These *Coleoptera* have never been identified with existing forms, and are, in fact, omitted from the Munich Catalogue. A special search for them, or rather for the pieces of resin in which they are contained, has recently been made in the University Museum at Oxford, at my request, but only one [*Calcar* (?) *inhumatus*] can be found. The genus of this latter can now be definitely stated, and some remarks on the three insects may be of interest.

1.—*Monomma resinorum*, pl. 87. There can be no doubt as to the correct determination of this genus, *Hyporrhagus* being confined to America. The unusually large, shallow, seriately-arranged foveae on the dorsal surface of the elytra, if not unduly magnified, as seen through the medium in which the insect is immersed, should render the identification of the species possible. Numerous very similar forms are found in Madagascar, S. Africa, the Philippines, Seychelles, etc.; but I have not come across one with the elytral foveae so large at the base. The structural details given by Westwood on this plate, as noted by him in pencil in a copy of the paper in the Hope library, were taken from other specimens in the Museum, one of which is there ticketed "Mad." (= Madagascar).

2.—*Megalocera rubricollis*, pl. 88. Hope did not mention the family to which this insect was to be referred, though a new generic name was used for it. To judge from the figures, *M. rubricollis* looks like an Oedemerid, but the very strongly serrate antennae resemble those of some of the Lagriids, among which Lacordaire placed the genus. The elytra are shown as strongly striato-punctate; the prothorax oblong-cordate, with acute, outwardly-directed hind angles; the intermediate tarsi 5-jointed (6 joints are clearly shown in the main coloured figure), and the posterior tarsi 4-jointed, both with broadly lobed penultimate joint; the apical joint of the maxillary palpi oblong-ovate, with truncated apex. In the Fry collection at the British Museum, a Brazilian Lagriid, identified by him as *Lagria collaris* Olivier, an insect roughly figured by that author, and no locality given, is placed under the generic name *Megalocera*; but it cannot be congeneric with Hope's species, and the identification with that of Olivier is incorrect.

3.—*Calcar* (?) *inhumatus*, pl. 89. There are two specimens of this insect preserved in one piece of resin, placed on the same line, whether viewed vertically or horizontally. One of them is in perfect condition, and shows, when examined at a particular angle, the stout triangular tooth at the apex of the anterior femur beneath, a character overlooked by both Hope and Westwood. This structure, combined with the form of the head, at once indicates the genus *Gonocnemis* Thomson (1858), which is placed by Lacordaire in his section "Megacanthides" of the *Tenebrionidae*, numerous in species in Tropical Africa, east and west. It is not improbable that *C. inhumatus* could be identified amongst the material in the British Museum or elsewhere, if removed from the resin and cleaned.

From a study of these three beetles, it can be safely assumed that they are all E. African. "Resin Animé" is a recently-formed product, akin to gum copal, and the insects found in it may be referable to existing forms.

Horsell, Woking:
December 11*th*, 1916.

[The name "Gum Animé" was originally applied to the resin of the Tropical American tree, *Hymenaea courbaril* (Nat. Order *Leguminosae*), and has been transferred to the product of the allied African *Trachylobium hornemannianum*. The latter resin is better known under the title of "Copal," as a basis for the finest kinds of varnish, and the most esteemed quality comes from East Africa, where it is found in a sub-fossil state over a large extent of country, the recent resin being of comparatively little value. At Zanzibar and other ports on this coast, pieces of "Copal" enclosing *Coleoptera* and other insects, often in a beautiful state of preservation, are commonly sold as "curios." The resin in which the Hope specimens are contained appears on examination to be true African "copal."—J. J. W.]

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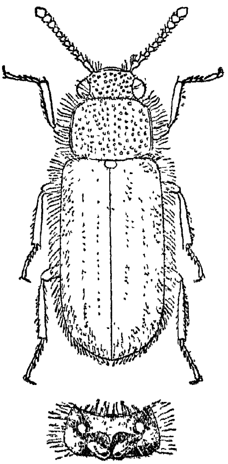
[*Reprinted from the 'Entomologist's Monthly Magazine,'* 3rd ser., vol. viii.]

THE GEOGRAPHICAL DISTRIBUTION AND SYNONYMY OF THE DASYTID-BEETLE *ACANTHOCNEMUS NIGRICANS* HOPE (=*CILIATUS* PERRIS).

BY G. C. CHAMPION, F.Z.S.

Bourgeois (Bull. Soc. Ent. Fr. 1904, pp. 25, 26), in a paper entitled "Sur le cosmopolitisme de l'*Acanthocnemus ciliatus* Perris, Coléoptère de la tribu des Dasytides," gives a detailed account of the extraordinary distribution of this beetle and of its formidable synonymy. The species, he says, has been described under six different names, and referred to three different genera. Nevertheless, two specific names have still to be added, *nigricans* and *fuscipennis* Hope, one of which, *nigricans*, must replace that of *ciliatus* Perris, it having 21 years' priority. The types of Hope's insects, both of which were referred by him to the genus *Dasytes*, and both from Adelaide, S. Australia, have been lent me by Prof. Poulton, and they agree perfectly with an example of *Acanthocnemus ciliatus* from Erbalunga, Corsica, kindly communicated by Lt.-Col. J. St. Claire Deville. Mr. A. M. Lea, in re-describing these Australian insects in 1909, is the only author who has noticed one of the most important characters of the genus, viz. the presence of very deep, almost circular foveae (these having a silvery appearance in certain lights) on the propleura, about which the French and German writers say nothing, their diagnoses having doubtless been drawn up from carded specimens. *A. nigricans* has the general appearance of a Trogositid or Cryptophagid, and the hairy body and ciliate elytral margins of certain Dasytids, amongst which the genus seems best placed.* The insect has been described by Lea, as well as by other authors, and it is only necessary to say that it is of a flattened, subcylindrical shape, blackish or fuscous in colour, with the antennae and legs more or less ferruginous; the numerous specimens before me measure from 4–5¼ mm. in length and 1½–2 mm. in width. The characters of the genus given below were taken from Australian and Rhodesian examples before the descriptions



Acanthocnemus nigricans Hope, ♂, × 9, the long hairs on the dorsal surface omitted; the lower figure shows the prosternal foveae.

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* The genus *Antirroon* Gorh. (1886), type *A. cribripenne*, from Panama, described as a Melyrid, is a Trogositid allied to *Diontolobus* Solier.

of the Continental authors had been seen by me, or the identity of their insects with Hope's species had been suspected. This definition adds a few particulars regarding the structure of the mouth-parts, tarsi, prosternum, etc. In the short basal joint of the tarsi and the flattened subcylindrical body, *Acanthocnemus* approaches *Pelecophorus* Latr., which includes two or three species from Mauritius and Réunion; but it differs from that genus in the structure of the palpi, antennae, tibiae, and tarsal claws, the bristly vestiture, and the deeply foveate prosternum. The specimens assumed to be ♂ have four visible joints only to the anterior tarsi, a character common to several genera of Malachiids.

The revised synonymy and generic definition will stand thus:—

ACANTHOCNEMUS.

Acanthocnemus Perris, Ann. Soc. Ent. Fr. 1866, p. 187; Bourgeois, Bull. Soc. Ent. Fr. 1904, p. 26; Reitter, Faun. Germ., Käfer, iii, p. 283 (1911).

Eurema Abeille de Perrin, L'Echange, x, p. 93 (1894); Bull. Soc. Ent. Fr. 1896, p. 261.

Hovacnemus Fairmaire, Ann. Soc. Ent. Belg. xlii, p. 232 (1898).

Dasytes (Paykull), Sect. 1, Lea, Trans. Ent. Soc. Lond. 1909, p. 239.

Head transverse, broad, the epistoma short, confused with the front; labrum short; eyes large, entire; mandibles stout, dentate before the middle within, feebly emarginate at the tip; terminal joint of the maxillary and labial palpi narrow, subcylindrical, truncate at apex, the penultimate joint short; antennae 11-jointed, stout, joint 1 very stout, 2–11 perfoliate, 2 and 3 obconic, 4-8 submoniliform, transverse, 9–11 much stouter than those preceding, together forming a loose club; prothorax transverse, sharply margined at sides and base; scutellum strongly transverse; elytra long, flattened, subparallel, with numerous rows of punctures, the epipleura reaching as far as the apex of the metasternum; prosternum with a deep, almost circular, flat-bottomed fovea on each flank exterior to the sinuous transverse ridge closing the anterior coxal cavities in front, the cavities themselves widely open behind, and the coxae contiguous; five ventral segments exposed; tibiae asperate, subdenticulate on their outer edge, the spurs short; tarsi simple, 5-jointed, 1 short, wanting or fused with 2 on anterior pair in ♂, 5 long, the claws long, simple; body subcylindrical, hairy, the hairs forming a close fringe along the elytral margins, the antennae and tibiae setose.

Type, *Dasytes nigricans* Hope (=*Acanthocnemus ciliatus* Perris).

Acanthocnemus nigricans.

Dasytes nigricans Hope, Trans. Ent. Soc. Lond. 1845, p. 105[1]; Lea, *op. cit.* 1909, p. 243[2].

Dasytes fuscipennis Hope, *loc. cit.*[3]; Lea, *op. cit.* p. 241[4].

Acanthocnemus ciliatus Perris, Ann. Soc. Ent. Fr. 1866, p. 188[5]; Schilsky, in Küster's Kaf. Europas, xxxi, no. 16 (1895)[6]; Bourg., Bull. Soc. Ent. Fr. 1904, pp. 25, 26[7].

Acanthocnemus truquii Baudi, Berl. ent. Zeitschr. 1873, p. 321[8].

Acanthocnemus fauveli Bourg. Rev. d'Ent. 1884, p. 289[9].

Eurema dilutum Abeille de Perrin, L'Echange, x, p. 93 (1894)[10]; Bull. Soc. Ent. Fr. 1896, p. 261[11].

Acanthocnemus kraatzi Schilsky, Deutsche ent. Zeitschr. 1896, p. 361[12].

Hovacnemus pallitarsis Fairm. Ann. Soc. Ent. Belg. xlii, p. 232 (1898)[13].

Hab. AUSTRALIA[7]; S. AUSTRALIA, Adelaide[1–4] (*Fortnum*: *types in Mus. Oxon.*; *Mus. Brit.*); W. AUSTRALIA[4]; NEW SOUTH WALES[4]; QUEENSLAND[4]; TASMANIA[4]; NEW CALEDONIA[9]; SIAM (*Vitalis de Salvaza*: iv.1920); BURMA (*coll. H. E. Andrewes*); INDIA, Tenasserim[7] (*Fea*: 1887); MADAGASCAR[13]; S. and N.W. RHODESIA, various localities (*Dr. Marshall, H. C. Dollman*: 1901–1915); GUINEA[12]; ALGERIA[10]; CORSICA[5 6]; SARDINIA[11]; CYPRUS[8].

According to Mr. Lea[4], this is probably the most widely distributed Malacoderm beetle in Australia, occurring under the bark of *Eucalyptus*-trees, and also coming to light at night. It would therefore appear that Australia is the real home of *A. nigricans*, Fortnum having captured specimens at Adelaide as long ago as 1841. The next record, 1866, is that of an example found by Revelière under the bark of a juniper in Corsica. Presumably the insect has been transported by commerce, either in the larval or imaginal condition, in cereals, etc., like *Plochionus pallens*, *Tenebroides mauritanicus*, *Silvanus surinamensis*, *Platycotylus inusitatus*, etc., and has now become cosmopolitan throughout the warmer parts of the Old World. The present writer has recorded[*] the capture of living examples of an Argentine Dasytid, *Astylus atromaculatus* Blanch., at Durban and Pretoria, which were probably brought there in hay during the Boer War.

Horsell.
March 1922.

Ann. Mag. Nat. Hist. (9) ii, p. 352 (Oct. 1918).

From the ANNALS AND MAGAZINE OF NATURAL HISTORY,
Ser. 8, Vol. xvii., *May* 1916.

A new Genus of Anthicidæ (*Coleoptera*) *from the Islands of Mysol and Waigiou.* By G. C. CHAMPION, F.Z.S.

MR. BLAIR having called attention to the systematic position of the Australian genera *Lemodes*, *Lemodinus*, and *Trichananca* [Ann. & Mag. Nat. Hist. (8) xi. pp. 207–209 (1913)], it is advisable to describe an allied genus found by the late A. R. Wallace in the above-mentioned Malayan islands. Specimens of this insect were acquired by Westwood for the Hope Museum more than fifty years ago, and others have also been detected amongst the Lagriids in the British Museum.

LAGRIOMORPHA, gen. nov.

Head short, subtriangular, broadly truncated above the moderately wide neck, the eyes small, rounded, prominent, inserted at a little before the base, the epistoma transverse, depressed, confused with the front, and somewhat prominent, the antennæ stout, rapidly widened outwards, inserted beneath a tuberculiform prominence at some distance from the eyes; labrum short; mandibles short, broad, feebly bidentate at tip; mentum strongly transverse, supported by a broad gular process; maxillary palpi stout, joint 4 strongly securiform; terminal joint of labial palpi stout, ovate, obliquely subtruncate at tip; prothorax subcampanulate, convex, immarginate laterally and at base, about as wide as the head; scutellum transversely quadrate; elytra long, confusedly punctate, the inflexed portion almost covering the metathoracic episterna, the epipleura narrow, incomplete; prosternum separated from the propleura by an oblique suture; anterior coxal cavities widely open behind the large, conical, contiguous coxæ; mesosternum long, very narrowly separating the middle coxæ; ventral segment 1 as long as the metasternum, 2–5 comparatively short, subequal; posterior coxæ rather large, well separated; legs moderately stout; tibiæ finely carinate towards their outer edge, above and beneath, the spurs minute and scarcely visible; tarsi with their penultimate joint narrow, deeply excavate above for the reception of the terminal joint, the claws simple.

Type, *L. semicærulea*.

The Malayan insect forming the type of this genus would perhaps be mistaken at first sight for a Lagriid; but the widely open anterior coxal cavities and other characters bring it near *Lemodes*, Boh., and *Trichananca*, Blackb., recently referred by Blair to the Anthicidæ. The carinate tibiæ and the greatly widened outer joints of the antennæ separate *Lagriomorpha* from both these genera, the general facies, too, being very different.

Lagriomorpha semicærulea, sp. n.

Elongate, depressed, a little widened posteriorly, especially in ♂, subopaque, the elytra and under surface shining, finely pubescent; ochraceous or rufo-testaceous, the elytra with about the apical two-thirds metallic blue, the antennal joints from 4–6 onward (the rufescent tip of 11 excepted) black and densely pubescent, the posterior legs with the knees, tibiæ, and first tarsal joint (and in one specimen the corresponding portions of the intermediate legs also) sometimes more or less infuscate, the abdomen in great part piceous. Head closely, shallowly punctate; antennæ moderately long, joint 3 slightly longer than 2, 4–11 more elongate, becoming rapidly wider, 8–10 very broad, triangular, 11 acuminate-ovate, much longer than 10, constricted at the middle; joint 4 of maxillary palpi broader in ♂ than in ♀. Prothorax about as long as broad, rounded at the sides, obliquely constricted before the base, closely, shallowly punctate, the interspaces alutaceous. Elytra broader than the prothorax, more elongate in ♀ than in ♂, slightly depressed below the base, closely, rather coarsely, confusedly punctate. Beneath closely, minutely punctate, with scattered larger punctures intermixed.

Length 5½–8, breadth 1½–2¼ mm. (♂ ♀).

Hab. Mysol and Waigiou (*A. R. Wallace*).

Described from four females and two males, two of the former, from Mysol, belonging to the British Museum (*ex coll. Pascoe*), the others purchased by the Oxford Museum in 1862 or 1863, one only of them (a ♂) being from Waigiou. The males (one from each island) are smaller and less elongate than the females, and both of them have an indication of a faint, transverse or curved, pallid fascia on the disc of each elytron at about one-third or one-fourth from the apex.

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NOTES ON SOME AUSTRALIAN ANTS.

BIOLOGICAL NOTES BY E. B. POULTON, D.SC., M.A., F.R.S.,
AND NOTES AND DESCRIPTIONS OF NEW FORMS BY
W. C. CRAWLEY, B.A., F.E.S., F.R.M.S.

The following paper contains an account of some ants collected during 1914 in West Australia, South Australia, Victoria, and New South Wales. The notes on the habits of each species were made at the time of capture, and Professor Poulton has added further observations from memory. These are indicated by quotation marks and the initials " E. B. P." All captures without the addition of any name or initials were made by Professor Poulton, who contributes the following general notes:—

"During my brief visit to Australia—July 29th to August 27th, 1914, with a few hours at Fremantle on August 31st—I was much struck with the dominant position of the ants in the insect fauna. Other insects were scarce, especially the Lepidoptera; indeed the only day on which I saw an abundance of varied insect life was August 31st, at Cottesloe Beach, Fremantle, where the 'wattle' (*Acacia* spp.) was in bloom and attractive to many species. The important position taken by the ants is shown by the species recorded in the present paper, although allowance must be made for the fact that ants are more easily found in a time of scarcity than most insects. But I do not doubt that their predominance in Australia is real.

"I noticed when collecting *Camponotus nigriceps* race *dimidiata* (*infra* p. 125) under the bark of a prostrate tree-trunk near Healesville, Victoria, that Hemiptera on the bark of an adjacent tree were ant-like in appearance and especially in their movements; also at the same time small Coleoptera under and in rotten logs and on bark were, when running, very ant-like. Mr. R. E. Turner has recorded a unique feature in the mimicry, by a fossorial wasp, *Aphelostoma tasmanica* Westw., of the formidable 'Bull-dog' ants of the genus *Myrmecia*. When alarmed, the wasp often picks up a fragment of dead stick or leaf, which it carries in its mandibles, thus increasing the resemblance to an ant (Proc. Ent. Soc. Lond. 1919, p. xxxvii). I anticipate that the mimicry of ants will prove to be a special feature of the Australian fauna.

"In making the collection here described I received the kindest help from Mr. L. le Souef, Director of the Zoological Gardens, Perth, and from Mr. H. M. Giles, the Head Keeper; and at and near Healesville from Mr. R. Kelly. A few of the ants were collected in the Blue Mountains, N.S.W., by Prof. von Luschan, of Berlin."

Sub-family I. *Ponerinae* Lep.

Myrmecia vindex Sm.—☿. From many adjacent nests of various sizes. S. Perth, Swan River bank near Zoological Gardens, 2.viii.14 (*L. le Souef*; *E. B. P.*).

"This species is one of the well-known 'Bull-dog' ants of Australia, a term no doubt applied to many others in the genus. The number of nests in a small area seemed to be a definite habit and is probably advantageous on the Müllerian principle. An enemy having experienced the defensive powers at the mouth of one nest would carefully avoid disturbing others. Thus each nest would help in guarding the rest. The behaviour of the ants was different from any I have seen. Around and just inside the entrance, which appeared to descend vertically into the earth, was a little group of ants. The head of each ant was always facing outwards in the direction of possible attack. When disturbed, the ants walked slowly, with widely opened mandibles, towards the enemy. I have never seen suggested, in the bearing of an insect, so firm a confidence in the possession of terrible powers of defence and such relentless determination to use them. The result was to make them particularly easy to capture with the forceps; for retreat of any kind or the avoidance of danger by rapid movement was quite foreign to their nature."—E. B. P.

Some species of ants, by a system of colonisation in addition to the general mode of founding nests by means of fertilised females, succeed in establishing enormous colonies consisting of scores or even hundreds of separate nests, all the members of the different nests being on friendly terms with each other. This is the case with the common European *Formica rufa* and others, and it is possible that some species of *Myrmecia* have a similar habit. It would be interesting to ascertain whether the members of the different nests of *M. vindex* referred to above were friendly to each other.

M. forficata F.—4 ☿ ☿. Under log in bush, Victoria, near Healesville, Narbethong, Springbank. One ☿ has a ☿ of *Camponotus ferruginipes*, sp. n., fixed to its leg. "When the two were captured and put in the same box, the *Camponotus* seized the leg of the Ponerine. When the box was opened a few hours later the *Camponotus* was dead but still holding on tightly to the living *Myrmecia*."—E. B. P.

One deälated ♀ was taken under a log in the same locality (*R. Kelly*), and 3 ♀ under a stone near Black Spur in the same district (*E. B. P.*), 15.viii.14.

Amblyopone ferruginea Sm.—8 ☿ ☿. From nest under stone, Blue Mts., N.S.W., near Mt. Victoria, 23.viii.14.

A. australis Erichs.—2 ☿ ☿. Victoria, Healesville to Narbethong, Maryville road, 15.viii.14.

Euponera (*Brachyponera*) *lutea* Mayr.—☿ ♂. Near Perth, Yallingup to Mammoth and Lake Caves, under log or stone in bush, 31.vii.14.

☿ ☿, 5 ♂ ♂, and one alate ♀ were taken by H. M. Giles at Mundaring Weir, near Perth, 3.viii.14, and a single deälate ♀, taken at an earlier date by the same collector, bears the note "Probably Perth District." ♂ ♂ and ♀ ♀ of this very abundant species are often taken after the marriage flight without ☿ ☿, and it was probably from such a ♂ and ♀ that Mayr described the sexes of his species, as he says "*Probably* belonging to this species." Up to recent years I had never received either ♂ ♂ or ♀ ♀ taken with the ☿ ☿, and therefore when Prof. Poulton showed me some ☿ ☿ and one deälate ♀ (queen) taken together under a stone close to the platform at Picton Junction, near Perth, 1.viii.14, the ♀ differing entirely from Mayr's ♀, it occurred to me that this ♀ was the true female of *E. lutea*. I described this ant in 1918 (Ent. Rec. xxx. 5, p. 86) as the true ♀ of this species, or alternatively a "B" form. There is no doubt, however, that the ♀ described by Mayr is the typical ♀ of *lutea*, and therefore the very interesting one discovered by Prof. Poulton must be considered as a "B" form. It is just possible that it may be a parasitic ♀ of another species, though this is not so probable from its appearance. I have recently received many ♂ ♂ and ♀ ♀ taken in nests with ☿ ☿ from different parts of Australia, all the ♀ ♀ being the typical forms. It is a very variable ant as regards colour, ranging from pale yellow to almost black in the same colony, and numerous myrmecophiles are found in its populous nests. The figures show the great difference in size and structure in the two forms of ♀. In profile the scale of the "B" ♀ is thick like that of the ☿, not knife-edged as in the normal ♀.

Rhytidoponera (*Chalcoponera*) *metallica* Sm.—☿. One under log, Mundaring Weir, 3.viii.14; one ☿, Mundaring Weir, 3.viii.14 (*H. M. Giles*); and 6 under stone, Adelaide, Mt. Lofty Range, 10.viii.14.

The specimens from the latter locality are all uniform dark metallic green, and the coarse longitudinal striae on the front do not continue so far as in typical specimens; the scale is straight, not concave, behind; the first segment of gaster has shallow punctures among the fine striae, and the second segment has fewer and shallower ones. The anterior border of the clypeus has a somewhat more pointed form, and the head is not quite so emarginate behind as in typical forms.

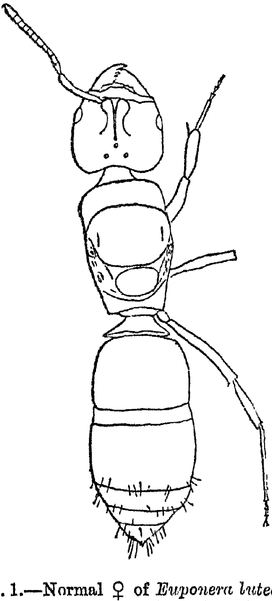

Fig. 1.—Normal ♀ of *Euponera lutea* Mayr. (On same scale as fig. 2.)

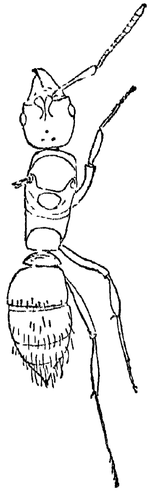

Fig. 2.—"B" ♀ of *Euponera lutea* Mayr. (On same scale as fig. 1.)

This very abundant ant varies greatly, and a number of varieties in addition to those already described might readily be named, but in all probability many of these slight variations are found in the same colony, especially the colour variations. The metallic sheen ranges in all shades from red and purple to green and blue.

R. (*C.*) *metallica* Sm., var. *tasmaniensis* Emery.—5 ☿. Near Perth, Yallingup to Mammoth and Lake Caves, under log or stone in bush, 31.vii.14.

R. (*C.*) *metallica* Sm., var. *cristulata* Forel.—♂ ☿. Blue Mts., N.S.W., near Mt. Victoria. Nest under stone, 23.viii.14.

For description of the ♂, which was taken on this occasion for the first time, see Ent. Rec. xxx. 5, p. 88 (1918).

R. (*C.*) *victoriae* André.—2 ♂, 6 ☿. Victoria, near Healesville, Narbethong, Springbank. Nest under log in bush, 15.viii.14.

♂ (hitherto undescribed). Length 4·8 mm. Black; tip of gaster, articulations of legs and terminal joints of tarsi, ferruginous, also mesonotum; antennae dark brown. Wings pale brown and iridescent, nervures dark brown.

Head broader than long, narrowing in front and behind. Mandibles with 7–8 teeth. Clypeus bulbous, depressed along anterior border, which is feebly convex. Frontal area triangular, slightly impressed. Eyes large and oblong, placed obliquely across the side of head in front of middle, occupying a little more than ½ the side. Scapes short, about twice as long as broad, nearly twice as long as 1st segment of funiculus which is about as broad as long; 2nd joint long, longer than the scape and 1st joint together, the rest diminishing in length and increasing in breadth to the apical, which is about as long as the 2nd. All except 1st much longer than broad. The whole antenna ¾ as long as the whole insect.

Scutellum prominent, a transverse impression dividing it from the scutum. Base of epinotum equals the declivity, the latter plane, sub-bordered. Scale from above longer than broad, the sides concave in front, the concavity forming a ridge which ends in a blunt tooth at each side. Underneath is a flat lamella ending in a blunt tooth directed forwards; in the centre of the lamella is a circular translucent aperture.

Pilosity: body sparsely provided with erect brown hairs; pubescence nil except on antennae. Tibiae with erect hairs.

Gaster and mandibles shining, the rest sub-matt. Mandibles with very few small punctures; rest of head roughened, mostly longitudinally. Scutum anteriorly with a short longitudinal impression from which radiate fine striae. Mayrian furrows with broad transverse grooves, shining, the rest and the scutellum irregularly and longitudinally rugose-striate. Epinotum irregularly and coarsely transversely reticulate. Node with irregular lines. Gaster shining and smooth, with traces here and there of superficial striae.

Sub-family III. *Myrmicinae* Lep.

Aphaenogaster (*Nystalomyrma*) *longiceps* Sm. — 13 ☿ ☿, near Healesville, Victoria, under rotting log, 16.viii.14. These ☿ ☿ agree perfectly with Smith's type.

A. (*N.*) *poultoni* Crawley.—Three ☿ ☿, taken by Prof. Poulton in the Zoological Gardens, Perth. I have received numbers of this species from the neighbourhood of Perth.

"I have no special recollection of the nest of *longiceps*, but I feel sure that the log when raised only disclosed a series of tunnels from which the ants were taken. The openings to the nests of *poultoni* in the Zoological Gardens were very characteristic. They were scattered sparingly over the bare turf and were all alike, being deep, circular, little craters, from memory about 1½ inches in diameter, with a small central hole passing vertically downward. The crater was surrounded by a wall of pure yellow sand evidently brought up from below the superficial soil, from which it was entirely free. The yellow sand also lined the crater, which, with its wall, was a very conspicuous object. Very few ants were seen in the craters, never more than one or, at the most, two in each."—E. B. P.

A. poultoni is described in a paper now being printed for the Ann. and Mag. Nat. Hist.

Pheidole variabilis Mayr var.—A single ♃ under stone, Blue Mts., N.S.W., near Mt. Victoria, 23.viii.14. This appears to be one of the numerous varieties of this species. It is very like var. *rugocciput* For. from Queensland, as it has the whole head longitudinally striate and reticulate between the striae, but the scapes are somewhat shorter than in *rugocciput*.

Monomorium (*Mitara*) *ilia* For.—☿ ☿ and 4 ♀ ♀, from nests in rotten wood, S. Perth, Zoological Gardens, and Swan River Bank, 2.viii.14 (*L. le Seouef*; *H. M. Giles*; *E. B. P.*).

Crematogaster australis Mayr.—☿ ☿, many ♂ ♂, 3 alate and one dëalate ♀, S. Perth, Swan River bank, near Zoological Gardens. From 3 nests in rotten *Melaleuca* trunk, 2.viii.14 (*L. le Seouef*; *E. B. P.*). "The nests, of which two were found on one tree, were excessively populous."—E. B. P.

This I take to be Mayr's species from his description, though I have never seen a co-type or a specimen named by a myrmecologist who has seen the type, and I am not completely satisfied that this is *australis*.

C. rufotestacea Mayr.—5 ☿ ☿, under log or stone in bush, near Perth, Yallingup to Mammoth and Lake Caves, 31.vii.14.

This is a very abundant species in Western Australia.

Sub-family IV. *DOLICHODERINAE* Forel.

Iridomyrmex detectus Sm.—☿ ☿. Mundaring Weir, near Perth, 3.viii.14; Perth, stations on railway to Busselton, 30.vii.14; Adelaide, Outer Harbour, 27.viii.14. "The entrance to the nests was very characteristic, being a single opening, leading vertically downwards, in the centre of a bare, smooth, circular patch, from memory about a foot in diameter. Across this patch the ants ran with great rapidity in their journeys to and from the nest. Known as the 'meat ant.'"—E. B. P.

Abundant almost over the whole continent.

I. discors For.—☿ ☿. Under log or stone in bush, near Perth, Yallingup to Mammoth and Lake Caves, 31.vii.14. Also a very abundant species in West Australia.

I. conifer For.—☿. Perth, stations to Busselton; Yallingup, close to sea, 30.vii.14. An extremely abundant species in W. Australia. The nests harbour a great number of myrmecophiles.

"The nests, which were especially common near the sea at Yallingup, resembled a small *Formica rufa* nest, but the material was coarser, grey in colour, and freely intermixed with sand. Near one of the nests in this locality a crowd of ants was seen busily engaged in attacking some object. One scoop with a moderate-sized pill-box secured 32 ☿ with their prey, a Noctuid larva. The contents of the box were poured into a cyanide bottle, and, when examined later, were found to include a large larva of the Myrmeleonid genus *Palpares*. It seems probable that this predaceous insect had been attracted by the number of ants at one spot and had tunnelled towards and beneath them. Its flexible limbs suggested that it had been alive when put into the bottle."—E. B. P.

I. emeryi Crawley.—♂ ♀ ☿. This species was described in Ent. Rec. xxx. 5, p. 90, 1918. "A moderate-sized flat stone formed the roof of a chamber the floor of which was crowded with winged ♀ ♀, while the ♂ ♂ were hanging, as densely packed, from the ceiling. The close proximity of the sexes—for the chamber was low—combined with their absolute segregation, was a very striking sight."—E. B. P. In the original description the locality was given as Victoria; it should be N. S. Wales, Blue Mts., near Mt. Victoria, 23.viii.14.

I. fornicatus Em.—10 ☿ ☿, under stone, Blue Mts., N.S.W., near Mt. Victoria, 23.viii.14. Kindly determined for me by Prof. Emery.

I. itinerans Lowne, race *nitidiceps* André.—1 ☿, near Perth, Yallingup to Mammoth and Lake Caves, under log or stone in bush, 31.vii.14. The specimen is damaged, but it is almost certainly this species, which I have frequently received from the Perth district.

I. rufoniger Lowne.—4 ☿ ☿, in flower of pink Mesembryanthemum, Adelaide, Outer Harbour, 27.viii.14.

I. sp.—☿ ☿, under stone, Victoria, near Healesville, near Black Spur, 15.viii.14. I am unable to identify this species at present.

I. (*Doleromyrma*) *darwinianus* For., var. *fida* For.—8 ☿ ☿. Yallingup to Mammoth and Lake Caves, under log or stone in bush, 31.vii.14. Kindly identified by Prof. Emery.

Leptomyrmex erythrocephalus F.—1 ☿, under stone, Blue Mts. N.S.W., near Mt. Victoria, 23.viii.14 (*von Luschan*).

Turneria frenchi For.—7 ☿ ☿, under stone, Blue Mts., N.S.W., near Mt. Victoria, 23.viii.14. Not having been able to compare this striking little species with Forel's co-types, I place it with some hesitation under *frenchi*, though it agrees fairly well with the description.

Sub-family V. *Camponotinae* Forel.

Notoncus sp.—4 ☿ ☿, 1 ♀ alate. These 5 specimens do not quite agree with any of the published descriptions. They are very like *gilberti* For., from Queensland, but are without the striae on the thorax. There are so few representatives of this genus in our collections in this country that I let them stand over for further material. The ☿ ☿ measure 4·5 to 5·1 mm. Near Perth, Cottesloe Beach, sea to railway station, in one nest, under a stone or piece of tin.

Notoncus sp.—A single specimen, a ☿, differing from the above, but indeterminable at present. Near Perth, Yallingup to Mammoth and Lake Caves, under log or stone in bush, 31.vii.14.

Camponotus (*Myrmoturba*) *nigriceps* Sm., race *dimidiata* Rog.—20 ☿ ☿, from nest under bark of prostrate trunk, Victoria, near Healesville, 16.viii.14. 9 ☿ ☿, under stone, Blue Mts., near Mt. Victoria, 23.viii.14 (*von Luschan*). "The ant-like Hemiptera and beetles with ant-like movements (*supra*, p. 118) were found near the Healesville nest."—E. B. P.

C. (*Myrmophyma*) *testaceipes* Sm.—6 ♃, 16 ☿ ☿, under log, near Perth, Mundaring Weir, 3.viii.14.

C. (*Myrmogonia*) *claripes* Mayr, race?—4 ☿ ☿ minor, near Perth, Yallingup to Mammoth and Lake Caves, under log or stone in bush, 31.vii.14.

Difficult to identify without ☿ ☿ major.

C. (*Myrmosphincta*) *suffusus* Sm., var. *bendigensis* For.—A single ☿ under stone, Blue Mts., N.S.W., near Mt. Victoria, 23.viii.14 (*von Luschan*).

C. (*Myrmosaga*) **ferruginipes**, sp. n.

☿ major. Length 9 mm. Deep black; masticatory border of mandibles reddish, funiculi dark red-brown, legs bright ferruginous.

Head very slightly broader than long, widest at eyes, sides feebly convex. Mandibles 6-dentate. Scapes pass the occiput by more than a quarter of their length. Clypeus feebly carinate. Anterior border very sinuate. Eyes flat, placed above the middle of sides.

Pronotum broad in front, the shoulders rather prominent and bordered. Base of epinotum 1¼ as long as declivity, saddle-shaped. Scale in profile twice as high as broad, bluntly rounded at top. From above it is wider than long.

Pilosity sparse, brown-yellow. A slight pubescence on head and gaster. Tibiae and scapes without erect hairs.

Moderately shining. Mandibles shining, with a few punctures and lines base; clypeus, cheeks, and the space between the frontal carinae have small, scattered, irregular punctures. Whole of head and thorax minutely and closely reticulate and semi-matt; on sides of thorax and on base of epinotum the sculpture has a more or less transverse direction. Scale with extremely fine encircling striae; gaster with even finer transverse striae. Legs microscopically reticulate-striate.

A single specimen, fastened, as related on p. 120, to the leg of a *Myrmecia forficata*, near Healesville, Victoria. The gaster is unfortunately somewhat damaged and some legs are missing. It is quite unlike any of the described forms of this subgenus from Australia. The *C.* (*M.*) *chalceus* Crawley, originally taken at Yallingup, comes nearest this species, but differs principally in colour. It has since turned out to be a very abundant species in Western Australia. See Ent. Rec. xxx. 5, 1918.

29 Holland Park Road,
London, W. 14.
March 1922.

IX. *New* Chrysids *from Egypt and Algeria.* By the Rev. F. D. Morice, M.A., F.E.S.

[Read May 3rd, 1916.]

Parnopes nilotica, n. sp.

Parva (long. circ. 5–6 mm.); capite et thorace viridibus et sparsim subauratis, postscutelli appendice brevissima thoracisque angulis postico-lateralibus concoloribus, tegulis alarum albidis; abdomine metallescenti-roseo vel carneo, segmentis—vel omnibus (♂! an semper?) vel solum tertio—apicem versus plus minusve virescentibus: segmenti 3tii parte apicali pallidiore (flavida), lateribus transversim ita impressis ut in medio quasi carinam relinquant, quae tamen carina in disco segmenti non continuatur; margine ipso scarioso et acutissime inaequaliter multispinuloso: antennis, mandibulis (apicibus harum nigris exceptis), ore, pedibus, et ventre flavido-testaceis, genibus vero et parte tibiarum albidis.

Cavitas facialis albo-pilosa, longitudine sua latior, lateribus (i.e. oculorum orbitis interioribus) fere parallelis. Clypei apex in medio excisus. Pronoti anguli antici in formam spinularum obliquarum excurrentes. Tegulae alarum (ut in hoc genere fieri solet) maximae, punctatae. Postscutelli apex vix mucronatus, sed tuberculo concolore parum conspicuo munitus. Caput thorax que crasse rugoso- vel reticulato-punctata; abdomen inaequaliter subtilius punctatum. Segmenti tertii partes impressae breviter albo-pubescentes: mesopleurae vero glabrae.

1 ♂, 2 ♀♀, taken by Dr. Longstaff at Khartum, 8–10. ii. 1909, and presented by him to the Hope Coll. in Oxford.

I treat this species as new on the authority of M. Robert du Buysson, who has kindly examined it for me and called my attention to several characters distinguishing it from *vareillesi*, Buyss., an Algerian form which superficially much resembles it.

In *vareillesi* the eyes are much larger, occupying more of the head, so that the face between them is narrower. They are also much wider above than beneath, while in *nilotica* they are regularly oval. Partly, no doubt, for this reason, the tempora in *nilotica* appear dilated behind the centre of the eyes (in the lateral view). The postscutellar appendage is evidently much longer in *vareillesi*, and is also *white* (as are likewise the posterior toothlike angles of the thorax), this difference of colour from the metallic areas round it rendering it exceedingly conspicuous. In *nilotica* both the angles of the thorax and the merely tuberculate apex of the scutellum are concolorous with the parts adjacent to them (green). It is also slightly smaller than *vareillesi*; the mesopleurae are not pubescent as in that species; and the dorsulum is more largely and uniformly punctured.

It cannot be confounded with *P. schmiedeknechti*, Mocs. (from Egypt and Palestine), that species having *inter alia* the thorax above, including the tegulae, concolorous with the abdomen, and very abnormal characters in the mouth parts, which do not exist in *nilotica.*

I am, however, not altogether certain that it may not prove to be a form of *P. elegans*, Klug, described (on a single ♀) from Ambukohl, Nubia, and apparently not since rediscovered. The figure in Symb. Phys. suspiciously resembles it. But the last segment in *elegans* is described as "laete viridi-aureo," which could hardly be said of any of Dr. Longstaff's specimens. And it should perhaps be noted that *elegans* was taken in July, but *nilotica* early in February.

Chrysis modestior, n. sp.

Statura minima (long. 3–4½ mm.); segmenti abdominalis 3tii serie anteapicali foveolarum circ-12 rotundarum mediocriter distincta, apice ipso integro, edentato, subtruncato angulis lateralibus rotundatis; postscutello convexo; oculis haud magnis, breviter ac late ovalibus; genis longis, convergentibus; cavitate faciali transversa, superne haud distincte marginata (sc. carina frontali nulla), in ♂ argenteo-pilosa, in ♀ glabra, basi sulco brevi lineari longitudinaliter impressa, in medio subtiliter oblique striolata, lateribus dense rugoso-punctulatis.

Corpus superne roseo-violascenti-metallicum, punctis haud profundis sed latis reticulato-scabrum, propterea que parum nitens; infra cyaneum. Cyanea sunt etiam cavitatis facialis pars media, tegulae alarum, propodei apex atque latera (area vero huius basali subvirescenti-ignea). Genae virides. Mesopleurae subauratae, sterna vero omnia cyanea. Segmenti abd. 3tii limbus apicalis cyaneus. Venter obscure cyanescens, maculis 2 basalibus segmenti 2di violascentibus. Pedes viridi-cyanei vel cyanei, tarsis vero brunneis.

Pronoti anguli haud spiniformes, fere recti. Antennarum articulus 3tius duobus sequentibus simul sumptis fere aequalis. Alae hyalinae nervis fuscis, cellulae radialis apice clauso.

2 ♂♂, 2 ♀♀, Hammam-bou-hadjar, Algeria (Province of Oran): 21. iv. 1910.

An exceedingly small and (to the naked eye) rather duskily coloured species. I found it settling on stones at the foot of a sort of cliff where the pretty little Masarid wasp *Quartinia major*, Kohl, was abundant, and suspect that it may be parasitical on that species.

Chrysis sefrensis, Buyss. ♂.

This species was described by Vicomte R. du Buysson in the Revue d'Entomologie, August 1900, from a single ♀ taken by M. Abeille de Perrin at Ain-Sefra in Algeria (Province of Oran). I believe that it has not been since recorded, and that the ♂ is still unknown.

I was so fortunate as to meet with both sexes at a much more northern locality in the same province, viz. at Hammam-bou-hadjar, in April 1910. M. du Buysson has kindly compared the ♀ with his original type and satisfied himself of their identity, and it is at his request that I here record the hitherto unpublished ♂.

It is exceedingly like the ♀, so that a complete description of it would be superfluous. But the genae are slightly less developed, evidently shorter than the scape of the antennae, their exterior outlines (frontal view) not quite so parallel, though the convergence is exceedingly slight, and their inferior angles not so sharply prominent. In colour its only difference from the ♀, so far as I can see, is a slightly greater prevalence of the red (or coppery) tints over the green with which they are blended, especially in the head. Thus the vertex, almost the whole face, and the second joint of the antennae, are thoroughly cupreous in the ♂, while in the ♀ all these parts are more or less virescent. The third antennal joint appears to me to be altogether non-metallic, while in the ♀ it is green above like the second. As usual in the Genus, the ♂ 3rd abdominal segment is shorter and more truncate at the apex than in the ♀, and, perhaps for this reason, the four "teeth" appear shorter in proportion to their breadth; especially the exterior pair are evidently far more obtuse than in the ♀, and lie

wholly on the apical margin of the segment (not, as in the ♀, forming a portion of its lateral margin also !).

The ♂ was taken on April 27, the ♀ on April 24; both, probably, in a waste and stony patch of ground abounding in *Ferula*, but of this I am not absolutely certain, nor can I say whether they occurred on the plants or on the stones. (Most of my captures in that place, however, were on the latter, for the *Ferula* had mostly gone to seed, and ceased to be attractive to *Hymenoptera.*)

Chrysis scintillula, n. sp. ♂.

Parva (long. in ♂ circ. 5 mm.); laete viridis; tegulis alarum, suturis juxta latera propodei, pedum anteriorum tibiis, abdominisque limbo apicali quadridentato aureo-rutilantibus; etiam vertice, mesonoto cum scutello, abdominisque regionibus quibusdam dorsalibus, plus minusve (secundum lucis incidentias varias) inter viride et rutilum versicoloribus; tarsis pedum omnium antennarumque albo-pruinosarum flagellis brunnescentibus, scapis harum cum articulo tertio (quarto dimidio longiore) viridi-metallescentibus, articulo vero secundo (brevi) aureo-rutilo.

Oculi prominuli, latitudine sua paullo longiores. Genae longae, scapis antennarum subaequales, valde convergentes. Facies superne lata, carina tenui sed distincta (quae tamen ad oculos non attingit) ab ocellis separata; in medio sulco nitido longitudinali divisa; lateribus dense subtiliter punctatis; argenteo-pilosa.

Pronotum transversum, antice in medio impressum haud profunde; angulis lateralibus subacutis (non autem spiniformibus). Postscutellum simplex, fere planum.

Segmenti abdominalis tertii latera (desuper visa) fortiter a basi usque ad apicem fere recte convergentia; series anteapicalis foveolarum (in exemplari hoc octo) satis profunde impressa; dentes apicales quattuor, forma triangulari, magnitudine inter se non multum differentes, exteriores vero plus minusve introrsum deflexi proptereaque dentibus interioribus porrectis etiamque suberectis aliquanto minus conspicui.

Corporis dorsum punctis magnis crassisque—in vertice et pronoto quasi reticulatis, alibi magis inaequaliter sed fere ubique dense congregatis—, scabrum: exceptis limbo bene definito postico scutelli singulariter (an semper?) prorsus laevigato, et segmenti abdominalis 3tii apice (post foveolas) punctis magnis nullis sed tantum minutissime vix visibiliter punctulato.

(Alas, in exemplari unico casu aliquo laceratas et pertusas, describere non tento!)

1 ♂ taken by myself on *Ammi visnaga*, just outside the village of Sidi Okba, near Biskra, in Algeria (Province of Constantine): 16. vi. 1911.

The size and general appearance of this insect give it a superficial likeness to *Chrysogona assimilis*, Dhlb. (? *pumila* Klug). But the long genae at once separate it from that species; and though in my specimen the upper wings are sadly torn, and one is wanting altogether, enough remains of the other to show that its neuration is not that of a *Chrysogona* but of a *Chrysis*.

XXIV. *On the Hymenopterous genera* Trichogramma, *Westw., and* Pentarthron, *Riley.* By R. C. L. PERKINS, D.SC., M.A., F.E.S.

[Read February 5th, 1913.]

PLATE XXXIII.

IT has for a long time been an uncertain question amongst students of the Chalcid group of Hymenoptera, as to whether the genera *Trichogramma* and *Pentarthron* are distinct, or the latter a mere synonym of the former. In the latter part of last year (1912) Prof. E. B. Poulton of the Hope Department of Zoology at Oxford was so kind as to offer me the opportunity of examining at leisure the unique type of Westwood's *Trichogramma evanescens.* The specimen is very old and bears the label "*Trichogramma evanescens*, Westw., Phil. Mag., minute sp. Chalcidiae, at Chelsea, June 11th, 1828."

A preliminary examination with a strong lens and compound miscroscope showed one fore-wing to be in good preservation, though with a good deal of dust and dirt obscuring the details of the hairy clothing. The other fore-wing was torn and the one lower wing was crumpled. A projection from the head proved to be the long scape of one antenna, but the critical joints were missing, and there were no parts of the antennae gummed on the card. After making drawings of the entire front wing, as well as could be managed without cleaning, the specimen was relaxed and much of the dirt removed. The gum with which the insect had been stuck down swelled up greatly (being probably tragacanth) and was with much difficulty separated from the insect, even the upper surface of the wing not being free from it. Subsequently the specimen was mounted in Canada balsam and fresh drawings of the wing made.

The front wing, as can be seen from figure 1, agrees in all essential characters with that of *Pentarthron.* Compared with a species of the latter from Hawaii (fig. 2) the one really notable difference is that whereas in *T. evanescens* there are only two hairs placed transversely on the wing beneath the lower extremity of the stigmal vein, in the Hawaiian species there is a long row of these hairs, meeting at right angles (or nearly so) with the inner extremity of the second hair-line from the dorsal margin of the wing. The hair-lines, marked *a* and *b*, which converge basally to enclose a triangular space, include irregularly disposed hairs, which are rather different from those of fig, 2, and altogether less numerous than those in the same area of *P. flavum* of Hawaii, shown in fig. 3. Whether the differences in the clothing of this area are even of specific value is very questionable. It is worth remarking that in all Hawaiian forms of *Pentarthron*, however they may differ in colour of body or wings, the transverse hair-line from the lower end of the stigmal vein always remains conspicuous and consists of many hairs.

The neuration of *Trichogramma* and *Pentarthron* appears identical, for the apparent form of the veins appears a little different in different examples of a species, owing to slight differences in mounting, the pressure on the wing, etc. In fig. 6 the neuration of *P. flavum* is shown, in fig. 7 that of *T. evanescens*. The position of the macrochaetae, indicated by black dots, is practically the same and their number (8) is also the same in each. The marginal cilia of the fore-wing are slightly longer in *T. evanescens* than in Hawaiian *Pentarthron*.

It is much to be regretted that the antennae of the type of *Trichogramma* are wanting, as these organs alone could absolutely settle the question of the identity of the two genera or their distinctness. Fig. 4 is the antenna of *T. evanescens* after Westwood,* and it is extremely different from that of *Pentarthron* (antenna of *P. flavum*, fig. 5), nor is it like the antenna of any Trichogrammid with which I am acquainted. The antennae of all the forms of *Pentarthron* ♀ I have examined are very similar, consisting of a long scape, an elongate pedicel, followed by an extremely short transverse ring-joint, two short funicle joints and a great solid club, or 6 joints in all. Westwood

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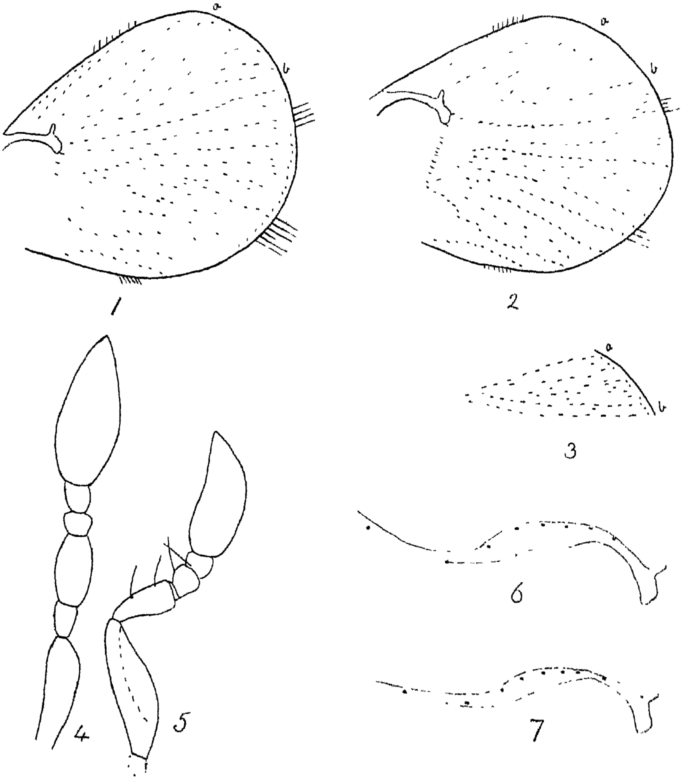
* Since this was written I have seen the figure of *T. evanescens* (presumably copied from Westwood's paper) in Wytsman's Gen. Insectorum. This figure represents the antennae quite differently from that in Westwood's "Classification," and the whole insect bears no resemblance to the type specimen. In fact it is so unlike, that it cannot even be considered as a caricature of the species.



R. C. L. Perkins, del. *C. Hentschel.*

TRICHOGRAMMA, Westw. and PENTARTHRON, Riley.

figures no ring-joint, but its position is occupied by a great elongate funicle joint, longer than the two following together.

In spite of this I believe that *Trichogramma* and *Pentarthron* will prove to be the same, for the antennae of Trichogrammids usually distort and shrivel (often beyond recognition) on drying, and even in balsam preparations, unless they are carefully prepared, are often far from satisfactory. Westwood's figure is drawn with the antenna forming a straight line, but I suspect that it was made from a specimen in which the pedicel was partly hidden beneath the scape. In a specimen that I possess, this gives an appearance of a division of the large pedicel joint, rather similar to the 2nd antennal joint, that he figures. The regular fringe of hairs that he gives to the two short funicle joints, is probably due to clothing, similar to that found in *Pentarthron*, viewed in a particular way. In some aspects it may be seen also on the club of the latter.

No doubt Lepidopterists, who have collected eggs of moths, especially those of *Pyralidina* and *Tortricina*, in the field, must have often bred British examples of *Trichogramma*, and I should be very glad to receive examples of these for comparison with the type. Being amongst the smallest of all known insects many specimens may emerge from a single moth's egg.

EXPLANATION OF PLATE XXXIII.

FIG. 1. Front wing of *Trichogramma evanescens*, Westw. The marginal cilia are only partly shown, so as to indicate their length at different parts of the wing-margin.

2. Front wing of *Pentarthron* sp. from the Hawaiian Islands.

3. Portion of front wing of *P. flavum*, Perkins, from the same locality.

4. Antenna of *Trichogramma evanescens*, Westw. (from the figure in his "Introduction to Modern Classification of insects," vol. ii, p. 155, fig. 9). The hairs on the funicle are omitted.

5. Antenna of *Pentarthron flavum*. Four conspicuous setae on the pedicel and funicle joints are shown.

6. Neuration of *P. flavum*.

7. Neuration of *T. evanescens*.

Boletín de la Sociedad Aragonesa de Ciencias Naturales.—Marzo de 1914

Algunos Neurópteros del Museo de Oxford

POR EL R. P. LONGINOS NAVÁS, S. J.

I SERIE

En estas notas consignaré los Neurópteros que del Museo de Oxford haya recibido para su estudio y merezcan mención especial o por su novedad o rareza o por alguna otra circunstancia digna de tenerse en cuenta. La enumeración se hará agrupándolos por familias y tribus.

Fam. MANTÍSPIDOS

Trib. MANTISPINOS Nav.

1. **Mantispa pictiventris** Gerst.

Australia: «N. S. W. Sydney, 10 m. 5. of. alt. 100 fect, Oatley, Capt. 25 Nov. 1905, J. J. Walker, R. N.»

2. **Mantispa crucifera** sp. nov.

Flava.

Caput oculis plumbeis; antennis fuscis, duobus primis articulis flavis; vertice fusco-rufo, linea transversa longa et alia brevi longitudinali, fere in +, flavis.

Prothorax inferne flavus, superne fusco-ruber, verruculatus, breviter pilosus, prozona margine antico rotundato et duabus striis longitudinalibus flavis; metazona duplo longiore, retrorsum leviter dilatata. Meso-et metanotum testacea, ad latera fuscescentia. Pectus flavo-testaceum.

Abdomen inferne flavum, linea longitudinali fusca; superne testaceum, tribus lineis longitudinalibus, parum definitis, media interrupta, fuscis; cercis ♂ cylindro-conicis, testaceis.

Pedes flavi, flavo pilosi, femoribus anticis duabus maculis internis nigris, posteriore ad primam spinam, anteriore ad apicem; tibiis anticis interne subtotis nigris.

Alæ angustæ, apice ellipticæ; reticulatione fusca, ad basim flava; stigmate elongato, rubro, interne obscuriore.

Ala anterior venulis costalibus 7; sectore radii fere 5 ramis; venulis gradatis 10.

Ala posterior venulis costalibus 5; sectore radii 5 ramis; venulis gradatis 9.

Long. corp. . . .	7-10	mm
— al. ant. . . .	8-11'5	»
— — post. . . .	7-10'5	»

Patria. «Tasmania, about 100 ft. Plenty, abt 30 m. N W. of Hobart, on Derwent Riv.» Julio 1902, J. J. Walker.

Nota.—Según el tamaño es bastante variable el número de ramos del sector del radio y consiguientemente de las venillas gradiformes, habiendo menos de lo que se ha indicado en la descripción, en los ejemplares pequeños.

3. **Mantispilla tenella** Erichs.

«Cape Colony. East London, 1-2 miles E. of, on Sandhills». 29 Sep. 1905, G. B. Longstaff.

4. **Mantispilla hæmatina** sp. nov.

Caput facie flava, linea longitudinali fusca; palpis flavis; antennis duobus primis articulis flavis, ceteris ferrugineis (ultimi desunt); fronte et vertice subtotis fusco-rubris, lineola inter antennas et circum oculos, flavis; oculis fuscis.

Prothorax elongatus, lævis, inferne testaceo-ruber, superne flavo-testaceus; prozona brevi, margine antico convexo, vix medio angulato, flavo; fascia transversa anteriore, lateraliter cum linea postica transversa concava, fusco-rubris; metazona triplo longiore, cylindrica, transverse rugosa, linea duplici dorsali longitudinali fusco-rubra Mesonotum subfuscum, proscuto transverso, in angulum sive tuberculum lateralem antrorsum producto, flavo; scutello flavo. Metanotum rubellum. Pectus rubrum.

Abdomen rubrum, superne fusco-maculatum.

Pedes flavi. Coxæ anticæ inferne fusco-rubræ. Femora antica superne, interne et linea externa juxta spinas, fusco-rubris. Coxæ et femora media et postica sanguinea.

Ala anterior venulis costalibus 6-7: sectore radii 4 ramis, 1, 2, 1 ex cellulis radialibus 1, 2, 3 procedentibus; venulis gradatis 8.

Ala posterior sectore radii 5 ramis; venulis gradatis 8.

Long. corp. ♀ . . . 3'5 mm.
— al. ant. . . . 11 »
— — post. . . 9'4 »

Patria. Africa meridional: «Salisbury, 5.000 feet, Mashonaland». Sept. 1900, G. A. K. Marshall.

5. **Necyla sacra** sp. nov.

Flava.

Caput linea longitudinali in fronte et in labro rubro-fusca; oculis æneis; vertice fusco-rubro lineato; antennis flavis, aliquot articulis ad medium et 7 ultimis fuscis.

Prothorax elongatus, totus punctis fuscis verruculatus, flavo breviter pilosus; prozona brevi, tribus lineis longitudinalibus fusco-rubris; margine antico late rotundato; metazona saltem triplo longiore; inferne linea longitudinali media fusco-rubra; fortiter rugosa, spatio oblongo laterali in medio anteriore lævi, tuberculis destituto. Meso-et metanotum ad latera fusca.

Abdomen flavum, superne fascia laterali et macula dorsali ad apicem aliquot segmentorum, fuscis; cercis ♂ brevibus, flavis.

Pedes coxis anticis superne et externe tuberculis exiguis fusco-rubris ad pilorum insertionem; femoribus anticis interne totis ferrugineis; spinis flavis, femoribus tibiisque mediis et posticis atomis minutissimis fuscis ad pilorum insertionem; unguibus posticis tridentatis, dente medio ultimo multo longiore.

Alæ hyalinæ, ellipticæ; reticulatione fusco-rubra; stigmate triangulari oblongo, flavido, ad subcostam ferrugineo, ferrugineo piloso, venulis costalibus 6-7, gradatis 7.

Ala anterior sectore radii 3 ramis, 1 ex prima cellula, 2 ex secunda ortis.

Ala posterior sectore radii 3 ramis, 1, 2, 1 ex cellulis 1, 2, 3 ortis.

Long. corp. ♂ . . . 8 mm.
— al. ant. . . . 9'5 »
— — post. . . . 8'2 »

Patria. Palestina. Rev. O. P. Cambridge, 1865.

6. **Necyla natalensis** sp. nov.

Caput facie testaceo-rubra, stria media longitudinali fusca ad clypeum et ad labrum; palpis flavis; antennis testaceis, medio et apice fuscis (seu fere 5 articulis ad medium et 5 ad apicem fuscis); vertice fusco, testaceo vario; oculis æneis.

Protherax elongatus, flavo breviter pilosus, inferne et leteraliter testaceus: fascia dorsali longitudinali fusco-nigra; prozona brevi, parum dilatata, margine antico anguloso; metazona triplo vel amplius longiore cylindrica, tenui, rugosa. Meso-et metathorax superne fusco-nigri, inferne testacei.

Abdomen testaceum, fascia dorsali longitudinali fusconigra; cercis ♂ brevibus, flavis.

Pedes flavi, flavo pilosi; femoribus anticis mediocriter crassis, superne linea longitudinali fusca, interne subtotis fuscis. Pedes medii et postici fusco pilosi. Ungues postici 5-dentati, unguibus lateralibus brevibus.

Alæ hyalinæ, ellipticæ; reticulatione fusca; venis proxime ante stigma flavis; stigmate triangulari parum elongato, rubello, fusco piloso, ad medium fusco-rubro.

Ala anterior venulis costalibus 7; sectore radii 3 ramis; venulis gradatis 6.

Ala posterior sectore radii 4 ramis; venulis gradatis 6.

Long. corp. ♂ . . . 8 mm.
— al. ant. . . . 9 »
— — post. . . . 7'8 »

Patria. Africa meridional. «Natal, 7-800 ft., near Durban», Malvern», G. A. K. Marshall.

7. **Climaciella 4-tuberculata** Westw.

India. Un ejemplar algo grande. Long. del ala ant. 17 mm

8. **Campion** gen. nov.

En obsequio del B. Edmundo Campión, S. J. uno de los más insignes alumnos de la Universidad de Oxford.

Antennæ insertione distantes plus quam latitudine primi articuli, tenues, articulis transversis.

Prothorax elongatus, prozona brevi, metazona saltem duplo longiore.

Abdomen ♂ cercis manifestis.

Coxæ anticæ divisæ. Tibiæ posticæ calcaribus brevibus. Ungues postici arcuati, haud dentati.

Alæ angustæ, stigmate elongato, radio apice ramoso; area apicali lata, venulis aliquot furcatis aut ramosis; area radiali angusta; cellula radiali primaria elongata, 3-4 cellulis divisa; sectore multis ramis.

Ala anterior cubito apice furcato et ramoso; postcubito et axillari apice furcatis.

Ala posterior procubito apice ramoso; cubito parum curvato, venula cum furca postcubiti conjunto.

N. B. Este género por la forma de las alas se acerca a los géneros *Euclimacia* Enderl. y *Nampista* Nav., pero por la del protórax y uñas posteriores se aparta mucho de ellos.

El tipo es la especie siguiente.

9. **Campion rubellus** sp. nov. (fig. 1).

Caput facie testaceo-rubra; palpis flavis; antennis testaceo-rubris, duobus primis articulis flavis; oculis fuscis; vertice ferrugineo.

Prothorax inferne flavus, lateraliter rubellus, superne ferrugineus; prozona brevi, parum dilatata, margine antico rotundato; metazona triplo saltem longiore, transverse fortiter rugosa, retrorsum leviter dilatata, apice ferrugineo-testacea. Meso-et metanotum fusco-ferruginea; mesonoti proscuto lateraliter in tuberculum acutum antrorsum producto. Pectus inferne testaceum.

Abdomen inferne testaceum, superne ferrugineum; cercis

♂ (fig. 1, a) conicis, inflatis, margine interno denticulatis, apice in dentem internum tenuem flexis, testaceis; lamina subgenitali transversa, apice late rotundata, flavida.

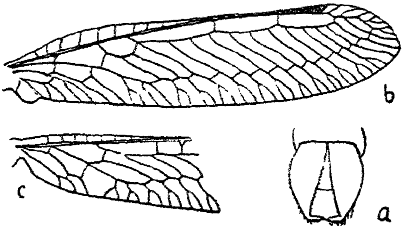


Fig 1
Campion rubellus Nav.
a. Extremo del abdomen ♂.
b Ala anterior ♀ × 2'5.
c. Base del ala posterior.

Pedes testacei; femoribus anticis mediocriter incrassatis, externe ferrugineo vage maculatis; spinis apice fuscis; femoribus mediis et posticis testaceo-rubris.

Alæ angustæ, apice ellipticæ; membrana fulvo leviter tincta, ad basim flavescente; reticulatione fusco-rubra; stigmate triangulari elongato, rubro sanguineo.

Ala anterior (fig. 1, b) area costali 10 venulis; sectore radii 10 ramis flexuosis; venulis gradatis 16; lobulo axillari prominulo, rotundato; macula exigua ferruginea ad angulum axillarem obtusum.

Ala posterior venulis costalibus 7; ramis flexuosis 10, quorum 3 ex prima cellula orti; venulis gradatis 14

	♂	♀
Long. corp.	13 mm.	23'5 mm.
— al. ant.	13 »	21 »
— — post.	13 »	18'5 »

Patria. Australia: «N. S. W. Sydney, 18 m. S. of 0-100 fb., National Park» 6 Diciembre 1902, J. J. Walker. He visto otro ejemplar ♂ de Australia del Museo de Londres.

Fam. RAFÍDIDOS

Trib. RAFIDINOS Nav.

10. **Agulla** gen. nov.

Prothorax fortis.

Ovipositor corpore brevior.

Tarsi primo articulo longo, secundo subduplo breviore, tertio brevissimo, bilobato, quarto gracili.

Alæ stigmate venula obliqua diviso; thyridio ad apicem venulæ primæ intermediæ; sectore radii 3 ramis; 5 cellulis discalibus.

Ala anterior cellula radiali primaria venulis radialibus in duas divisa, prima seu interiore duos ramos emittente; ramis anterioribus procubiti ramosis; cubito simplici; postcubito et axillari apice furcatis; 3 cellulis procubitalibus.

Ala posterior cellula radiali primaria in tres divisa, quarum secunda seu media duos ramos emittit; 2 cellulis procubitalibus; ramis cubiti ramosis.

El tipo es la especie siguiente.

La configuración de las alas es distinta de todos los demás Rafidinos, en los cuales el sector del radio no tiene más que dos ramos, y a lo sumo uno en cada celdilla radial secundaria, por lo cual las celdillas discales son tres, rara vez cuatro.

11. **Agulla Bagnalli** sp. nov. (fig. 2).

En obsequio del Sr. Bagnall, del Museo de Oxford, a cuya amabilidad debo el estudio de estos insectos.

Caput ovale, depressum, oculis prominulis, fusco-castaneum, ocellis concoloribus; linea transversa testacea ad clypeum, labro margine antico testaceo; vertice minute granuloso; occipite callo longitudinali medio ferrugineo.

Prothorax magis quam duplo, haud triplo longior quam latior, minutissime granulatus, retrorsum leviter ampliatus, fusco pilosus; inferne testaceus; superne medio anteriore ferrugineus, medio posteriore fuscus, tribus lineis apicalibus longitudinalibus ferrugineis, media breviore. Meso-et metathorax fusci, marginibus posticis ferrugineis; mesonoti proscuto ferrugineo.

Abdomen fuscum, inferne in ♂ margine postico segmentorum flavo, in ♀ apice ferrugineo; valvis genitalibus ♂ flavis, ovipositore forti, fusco, corpore breviore.

Pedes fusco pilosi; femoribus in ♀ fuscis, in ♂ testaceis; tibiis tarsisque flavidis.

Alæ (fig. 2) ellipticæ; reticulatione fusca, ad basim ferruginea; stigmate elongato, interne recto, externe obliquo, flavo-testaceo; venula obliqua, interdum furcata a tertio basilari marginis posterioris ad tertium apicale marginis anterioris diviso; subcostæ apice a stigmate parum distante, fere latitudine stigmatis aut paulo amplius; venula radiali ante stigma minus ab eo distante; ramis ad marginem externum furcatis ant ramosis; ramo apicali primo seu apice radii furcato, ad marginem anteriorem veniente.

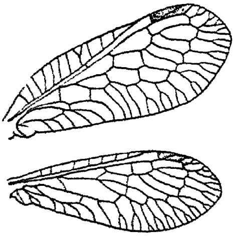


FIG. 2
Agulla Bagnalli ♀ Nav.
Alas.
(Mus. de Oxford).

Ala anterior area costali ante medium dilatata, 11-12 venulis; venulis gradatis (omissa radiali ultima) 5, angulo axillari obtuso, nubecula exigua ferruginea notato.

Ala posterior similiter constructa; area costali angusta, sensim angustata, 8 venulis; venulis gradatis (radiali ultima non numerata) 5; aliis 4 venulis ad medium alæ vel ante, fere in lineam transversam positis.

		♂	♀
Long.	corp.	12 mm	16 mm.
—	al ant.	15 »	15 »
—	— post.	12 »	13 »
—	ovipos.		9 »

Patria. Oceanía: «Vancouver J., Victoria, B. C. 1894-97,» Dr. E. Crompton (Mus. de Oxtord).

Zaragoza 3 de Enero de 1914.

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THE BUTTERFLIES OF THE OXFORD DISTRICT.

BY JAMES J. WALKER, M.A., R.N., F.L.S.

The varied geological formation of the country immediately adjacent to Oxford, and its rich flora and extensive tracts of woodland, some of them dating from very ancient times, are eminently favourable to butterfly-life; while the number of able resident collectors and observers, as well as the constant succession of enthusiastic young entomologists supplied by the University up to the commencement of the present war, has ensured its being one of the most thoroughly worked districts in the British Islands. Unfortunately the only fairly complete list of the local *Lepidoptera*, published in the Report of the Ashmolean Natural History Society for 1898, gives no details beyond the initials of the captor or observer of each species; but I found it of much service when, in 1912, I compiled a sketch of the insect fauna of the Oxford district for the use of the guide-book issued to the members of the International Congress of Entomology held here in that year, and of this the present paper, as far as the *Rhopalocera* are concerned, may be regarded as a reproduction, amplified and brought up to date where requisite. The list of *Lepidoptera* in the Victoria County History of Berkshire (1905), mainly compiled by Messrs. A. H. Hamm and W. Holland, though dealing with only a portion of the district, has also been of very material assistance in compiling these notes.

Of our 67 species of butterflies regarded as truly British, we now have definite records of 44 as having been observed in recent times within a radius of 10 miles from Carfax, the centre of Oxford, in addition to two or three species which may have formerly occurred within these limits. This tract of country is about equally divided by the Isis between the counties of Oxfordshire and Berkshire, and attains its highest elevation, 562 feet, at Shotover Hill, about three miles east of the city. It is well within sight of the beautiful and productive chalk ranges of the Chilterns and the Berkshire Downs, but does not include any portion of either; though one or two of the characteristic butterflies of the chalk, as *Agriades corydon* and (possibly) *Zizera minima*, have wandered from thence and have established themselves in outlying stations in the District. On the whole, our Oxford butterflies appear to hold their own very well from year to year, despite the fact that much of our old woodland has been drastically thinned out, and in great part replanted with uninteresting and unproductive Conifers.

Both *Pieris brassicae* and *P. rapae* are of course plentiful throughout the district, but, especially the former, vary greatly in that respect in different years; and their abundance here is no doubt largely affected by the vigorous crusade against them by school children, "head-money" for no fewer than 6000 "white" butterflies having been paid to one parish school alone, during the present year. In the autumn of 1917 the larvae of *P. brassicae* were most abundant, but were infested with the parasite *Apanteles glomeratus* to such an extent, that it is doubtful whether 1 per cent. of the whole number were able to reach the pupa state. *P. napi* is the commonest butterfly of our flowery water-meadows and river banks, and as usual exhibits a great range of variation in intensity of markings; in July 1910 I took at Cothill, Berks, an albino example of a clear creamy-white colour, without a single black scale in any part. *Euchloë cardamines* is also plentiful in most years, and is a conspicuous and beautiful feature of our grassy lanes and wood openings in May and June, specimens in good condition being sometimes seen well into July. *Colias edusa* and *C. hyale* are very uncertain in their appearance, and are never as plentiful as on the South Coast, but the former occurs sometimes in fair numbers, as was the case with *C. hyale* in the lucerne fields near Cowley in 1901 and 1902; and a fine specimen of the latter species was observed by Mr. J. Collins and myself in August 1911 at Weston-on-the-Green, Oxon (Ent. Mo. Mag. 1911, p. 217). *Gonepteryx rhamni* is common throughout the District, and specimens newly awakened from their winter sleep may often be seen in the main thoroughfares of Oxford on bright days in February and March, while the larva may be found readily enough on the buckthorn bushes at the proper season.

Apatura iris is by no means common, but has been taken at intervals in Bagley and other large woods, and Mr. A. H. Hamm on one occasion saw a fine ♀ on one of the roads near Shotover Hill; and on August 10th of the present year I saw a battered ♀ in a wood near Forest Hill, Oxon, where the butterfly had been previously seen by Mr. Collins, who also reported *Limenitis sibylla* from the same wood; the latter species has also occurred at Bagley Wood and near Radley. *Polygonia c-album* is also a rare visitor to the District, but it appears to be not uncommon at Wychwood Forest, Oxon; I saw two specimens, and caught one, on bramble-blossom near Tubney Wood, Berks, on August 12th of this year, and my friend Lieut. E. G. R. Waters took a fine example at Wytham Park on September 27th. *Eugonia polychloros* has been found in both the larva and perfect states in the immediate neighbourhood of Oxford, but is decidedly rare, and my experience of the butterfly is confined to the sight of a specimen in one of the main roads in 1911. *Aglais urticae* is usually plentiful, but in some years, as in 1916, is quite scarce, while *Vanessa io* is generally abundant—much more so, in fact, than I used to find it in Kent. I have no definite record of *V. antiopa* from Oxford itself, but in the University Museum collection there is a very fine specimen taken by the Rev. J. W. B. Bell in August 1900 on a sugared post at Pyrton, near Watlington, and just outside our limits. *Pyrameis cardui* and *P. atalanta* are as irregular in their appearance here as elsewhere, the latter being the more "dependable," but during the present year it has been most markedly rare, as I have not seen a single specimen myself, and have heard of but one or two at most as having been observed. *Dryas paphia* is common in the larger woods, but I saw a specimen in my own garden in July last, and on August 10th of this year, though then mostly in worn condition, it was as numerous near Forest Hill as in the New Forest a few weeks earlier. *Argynnis adippe* also abounds in Bagley and Tubney Woods, and in 1905 I took at the latter locality a beautiful variety of the ♂, having the basal and central black markings of both wings almost entirely suppressed. *A. aglaia* is decidedly rare, but has been observed this year in the large woods beyond Forest Hill by myself and others. *Brenthis euphrosyne* is abundant in most of our woods in May; a curious variety of a clear pale ochreous ground-colour above and beneath, now in the University Museum, was taken in Tubney Wood by the Rev. C. F. Thornewill on May 29th, 1916. *B. selene* is less common and more local, but occurs freely in damp spots in Tubney Wood; in the very hot summer of 1911 a partial second brood of small specimens appeared in August, of which there is a good series in the Museum. *Melitaea aurinia*, which formerly occurred at Bagley Wood, Headington Wick, and other localities in the district, now appears to be confined to a limited area near Cothill, Berks, where it varies greatly in numbers in different years. Although constantly on the spot from 1905 onwards, I did not see a specimen before May 22nd, 1909, when I found it flying in abundance, and very fine and variable; for several seasons afterwards it continued to appear more or less plentifully, but had become very scarce, or apparently absent from about 1914 until the present year, when it reappeared in something like its former abundance on May 25th.

Melanargia galatea is distributed over a considerable area of level country between Abingdon and Tubney, where it is found in abundance in grassy lanes, sandy and boggy fields, and is even a common roadside butterfly; it also occurs commonly in several places in Oxfordshire, as at Holton stone-pits near Wheatley. On the other hand, *Pararge aegeria* is singularly scarce, as I have heard of the occurrence of only one or two examples in our neighbourhood, though some of our woods appear eminently adapted for it. *P. megaera* is in some years also rather scarce, though in others, notably in 1917 and the present season, it has been exceedingly numerous, especially in the second brood. *Epinephile ianira* is abundant throughout the District, and a partial second brood of richly coloured specimens is sometimes observed in hot summers. *E. tithonus* is abundant in lanes and on roadsides, and *Aphantopus hyperanthus* in most years is very plentiful at bramble-blossoms in the woods; the var. *arete* is occasionally met with at Bagley, and I have taken a curious pale fuscous form at Cothill. *Coenonympha pamphilus* is, as usual, plentiful in dry places, but I have seen no striking variations of this species.

Zephyrus betulae is somewhat uncommon, but has been observed in more than one of our woods, and has its headquarters at Bagley; *Z. quercus* being much more common and widely distributed, and occurring occasionally in numbers (*cf.* Ent. Mo. Mag. 1918, p. 211). The entomological event of the present year is the discovery by a schoolboy, Walter Burrows, of *Strymon pruni* on June 23rd in a remote and not very accessible wood near the limits of our District; he kindly disclosed the locality to the Museum staff, and in consequence I had the pleasure on July 3rd of seeing this very interesting little butterfly alive for the first time, and of taking three or four good specimens on the blossom of the privet. *Thecla w-album* is fairly common about elms, and on bramble and privet-blossom at Radley, Besselsleigh, and Tubney, and *Callophrys rubi* is plentiful in woody places. *Rumicia phlaeas*, abundant in most years (especially so in 1911) sometimes presents very interesting variations, the var. *radiata* Tutt having occurred to me more than once at Tubney, and in the Museum is a beautiful example of the silvery-white form usually known as *schmidtii*, which was taken by Mr. W. Holland at Hen Wood, Berks, in August 1903. *Aricia astrarche* is common, especially at Tubney, and *Lycaena icarus* is usually plentiful in grassy places, but has been decidedly scarce this season. *Agriades corydon*, so abundant on the chalk hills beyond our limits, was up to 1916 known only from the District by single examples found casually on Shotover Hill and elsewhere, but in August of that year I found a station for the species on a limestone down between Headington and Stanton St. John, Oxon, where it is not rare, though very local. *Cyaniris argiolus* frequents the Oxford gardens and the "Parks," as well as the more rural lanes, and has of recent years become exceedingly common, especially in the spring brood, which is sometimes fully out in April; this year it appeared, with *Pieris rapae* as early as March 23rd. *Zizera minima* has been recorded for the District in the "Ashmolean" list by the late Mr. F. W. Lambert, but is evidently local and rare, and I know of no recent captures of the species.

One of the most interesting of our smaller woodland butterflies is the lively little *Nemeobius lucina*, which may be called abundant in places where primroses and cowslips grow freely at Bagley and Tubney Woods, Cothill, Wytham Park, &c., in May and early June. *Hesperia malvae* and *Thanaos tages* are both common, especially in the open parts of Wytham Park; and *Adopaea thaumas* and *Augiades sylvanus* are equally or more plentiful as well as more generally distributed.

Two other butterflies may at a former period have had a claim to a place on our Oxford list, though they have certainly not been observed in the District in recent years. Bagley Wood is given as a locality for *Melitaea athalia* in Morris's "British Butterflies," but the nature of the ground looks, to say the least, unlikely for this species, and its usual food-plant, *Melampyrum pratense*, is decidedly uncommon in the neighbourhood of Oxford. *Carterocephalus palaemon* was certainly met with in past years not rarely at Wychwood Forest, Enstone, and one or two other Oxfordshire localities, and probably still exists in some of these stations; but the rumour that it was formerly taken in Bagley Wood still lacks confirmation.

Aorangi, Lonsdale Road,
Summertown, Oxford.
October 15th, 1918.

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SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

By F. C. Woodforde, B.A., F.E.S.

The original source of this collection was the presentation to the Oxford University in 1849 by the Rev. F. W. Hope of all his very extensive collections of books, prints and zoological specimens, including that of the British Lepidoptera. This latter he augmented in 1857 by the purchase of the private entomological collection of Mr. J. O. Westwood, and the two were henceforward known as the "Hope-Westwood Collection."

In 1861 Mr. Hope founded and endowed the Hope Professorship of Zoology, and, exercising the right conferred by the Trust Deed, appointed the illustrious Curator, J. O. Westwood, to the Chair. At his death in 1893 he was succeeded by Dr. E. B. Poulton, D.Sc., F.R.S., etc.

The Hope Collections, at first housed in the Taylorian Buildings, were transferred about 1860 to the New University Museum which had just been completed. Thus originated the Hope Department of Zoology, greatly enlarged in 1894 by the addition of rooms formerly used by the Mathematical Professor, and again in 1912 by including the southern part of the old Radcliffe Library.

Later the Rev. F. M. Spilsbury, who died in 1878, left his entomological collection to the Hope Department, and this was combined with the Hope-Westwood Collection.

During the present century very large additions have been made to the entomological collections by bequest and gifts.

In 1906 the extensive British collection formed by J. C. and C. W. Dale was bequeathed by the latter to the Museum with the stipulation that it was to be kept whole and intact and not incorporated with other collections. Detailed notes on this collection were published in the 'Entomologist's Monthly Magazine,' 1907–1910, by Commander J. J. Walker, M.A., R.N.

In 1908 the collections formed by the late Mr. A. J. Chitty were presented unconditionally to the Museum by his widow, and in 1909 that of the late Mr. H. S. Sellon was given, also without condition, by his mother and sisters. In 1915 the collection of the late Mr. Pogson Smith, Fellow of St. John's College, Oxford, was similarly presented by his widow, and in the same year the collection of the late Prof. Meldola, F.R.S., was bequeathed by him to the Museum also without conditions attached. Finally, last year the collection of the late Lieut. R. J. Champion, of Jesus College, Oxford, who was killed in France during the war, was presented by his parents, also unconditionally. Furthermore, large additions have been made by the kindness of many private collectors. All these collections, with the exception of that formed by the Dales, have now been incorporated into one, and are contained in upwards of 500 drawers in more than twenty cabinets.

The specimens of each separate collection are at once identifiable by their labels, so that nothing is lost by incorporation, but on the contrary much is gained by the opportunity of easy comparison with other individuals from other collections. Ample space has been left for future additions, the aim being to represent, as far as possible, each species by a short series of specimens from every locality in its area of distribution in the British Isles.

The classification and nomenclature is that adopted by

South in 'Butterflies and Moths of the British Isles,' except for the Geometræ, for which group L. B. Prout in Seitz's 'Macro-Lepidoptera of the World' has been followed. Before entering upon more detailed description of species and particular specimens it may be observed that with a very few exceptions every species that has occurred in the British Isles is represented in the combined collections. Unfortunately before 1880 very few collectors labelled their specimens and accurate data of most of the specimens in the older collections were wanting, but even in these some of the very rare specimens have good data attached. As an eminent exception mention must be made of the great naturalist, William John Burchell, who, nearly a century ago, labelled his small collection of British Lepidoptera with the same accuracy and minuteness as the specimens in his vast exotic collections, which are also in the Hope Department. Even in the later collections many specimens which would otherwise have been of great value were unlabelled. And here perhaps, as a digression, attention may be called to the importance of accurate and minute data. Many collectors even of the present day seem to consider it sufficient to label their specimens with the locality and the year of capture, but for insects that have more than one generation in a year, the date of the year alone is of no use for the study of the very interesting subject of seasonal dimorphism—the dates of the month and the day of the month are essential. Taking the collection as a whole, however, by far the larger proportion is well furnished with accurate data, labels being attached not only to the insect itself, but a label also being pinned by the side so that the data are clearly legible to the observer. Historically, also, the collection is interesting, there being in the Hope Collection many specimens and some of the types of Haworth, and also some of Doubleday's specimens.

PAPILIONIDÆ.

PAPILIONINÆ.

Papilio machaon.—Twenty-four specimens, mostly from Cambridge fens, but 4 from Norfolk Broads, presented by the late Major R. B. Robertson. Very little noteworthy variation, but one very pale cream, almost white, bred by the late Lieut. R. J. Champion.

P. podalirius.—Two specimens in the Hope Collection, both unlabelled. The following is a quotation from Barrett's 'British Butterflies': "The Rev. F. W. Hope records that he has a specimen which he took at Netley (Shropshire), and also that he had two larvæ feeding on wild plum, but it does not appear whether they were reared."

PIERINÆ.

Aporia cratægi.—Forty-three specimens. Five from the Hope Collection, 11 from the Spilsbury, 9 from the Chitty, 10 from the Sellon, all without data. From the Meldola Collection are 8, 5 of which are labelled: 1 "Wales," but no date; and 4 "New Forest, Lyndhurst, 1875."

Pieris brassicæ.—A long series from many localities. A series of eight from the Isle of Wight labelled as a third brood from ova deposited in August, 1898, and as emerging October 13th, 1898. All of these are rather small. No remarkable variation, except that one male has a small black spot on the fore wings corresponding in place with the upper spot on the fore wing of the female. It was bred at Lee, North Devon, May 3rd, 1897, by Prof. Selwyn Image.

P. rapæ.—A long series of upwards of 100 from many localities among them a *quite* spotless male with the usual dark mark at the apex of the fore wings only indicated by a few grey scales, taken at Finchley, April 15th, 1893, by Dr. F. A. Dixey, F.R.S. Another very similar male from North Staffordshire, May 5th, 1917, taken by myself. In both the black spot on the costa of the hind wings is wanting. Several cream or pale buff-coloured females from various localities. A female with a third spot in the fore wings between the usual two, taken by myself in North Staffordshire. Several dwarfs.

P. napi.—A very long and varied series, from England, Scotland and Ireland. A *very* small female in the Sellon Collection taken in the New Forest in July, 1892. Another very slightly larger taken by Mr. Holland near Reading, in July, 1893, and three other dwarf specimens taken by myself in the New Forest. A very heavily marked female with the tips of the fore wings quite black, not grey, the base of the fore wings heavily suffused with grey; the veins of the hind wings pale, inconspicuous except near the edges of the wings, where they are quite black; north Staffordshire, August 7th, 1917, taken by myself. Another very similar from Perthshire, August, 1905, from the Meldola Collection. A long series from many parts of Scotland in which are many fine varieties from the Meldola Collection. A series of four very finely marked specimens from Enniskillen, bred by H. Main, presented by the late A. Harrison. One of the males has a supernumerary spot at the inner angle of the fore wings in the same position as the normal black spot of the female. A dark cream-coloured female from Tyrone.

P. daplidice.—Nine specimens, 4 from the Hope and 3 from the Spilsbury collections, without data. One from the Chitty Collection labelled, "Taken by a labourer near Brighton." Another labelled, "Berks, Ascot. Capt. July, '97, by J. Paterson, a schoolboy. Presented 1900 by H. A. Ormerod."

Euchloë cardamines.—A long series from many localities, but very little variety, except three very small specimens.

Leucophasia sinapis.—A long series of upwards of 100, including many ab. *diniensis*. Two specimens approach very nearly to ab. *erysimi*, having only a very few scattered grey scales at the apex of the fore wing.

Colias hyale.—Upwards of 70, chiefly from Sussex and Kent, but including a fine series of 15 from Oxford taken by Mr. A. H. Hamm. There is also a pale buff-coloured male from the Isle of Wight from the Meldola Collection. In a very remarkable specimen from the Spilsbury Collection, the black border is prolonged to the discal spot in the costal part of the fore wing, and the usual pale marks in the black area are reduced to three small dots in the upper half and a small spot towards the inner angle.

C. edusa.—A long series of upwards of 120, including 24 ab. *helice*. A female taken in Oxford, by Mr. A. H. Hamm, has a very large discal spot, thus approaching the Himalayan *C. fieldii*. A fine lemon-coloured male, taken at Sidmouth in 1872, was presented to the collection by Prof. Poulton. In some of the females the spots in the marginal black area are greatly reduced in size, and in one the spots are practically obsolete.

Gonepteryx rhamni.—A long series without many aberrations. A fine gynandromorph, in which the male colour predominates, has the female coloration in the whole of the left fore wing except the costal portion and in the lower portion of the right hind wing. It was taken near Reading about 1873; presented to the collection by Prof. Poulton. In a short series from the Champion Collection three males have the undersides of a buff colour instead of the normal greenish, while the uppersides are of the usual sulphur colour. Two of the females have the undersides pale buff with upper sides cream-coloured. They were all taken or bred at Woking about 1912. There is also a cream-coloured female with pale buff underside bred at Oxford, August 9th, 1918, by Mr. A. H. Hamm.

NYMPHALIDÆ.

APATURINÆ.

Apatura iris.—A fine series of 34—19 males, 15 females, all but one in perfect condition. Eighteen have full data. Of these 14 are from the New Forest, from the Chitty, Sellon and Meldola Collections. Four are bred from larvæ found near Oxford by Mr. J. Collins. The remainder, which are without data, are from the older Hope and Spilsbury Collections.

NYMPHALINÆ.

Limenitis sibylla.—A series of 58, mostly from the New Forest, but 11 from Berks, 7 from Surrey and 2 from near Oxford. All are normal except one ab. *nigrina* from the Spilsbury Collection and one intermediate with a portion of the white band clouded with black, from near Reading, taken July 17th, 1919, by the Rev. C. F. Thornewill.

Polygonia c-album.—Series of over 80, without any very remarkable aberrations. There are 7 ab. *hutchinsoni* from Leominster. Much variation is shown in the undersides, from an almost unicolorous very dark brown to the light, well-marked pale brown of ab. *hutchinsoni*.

Eugonia polychloros.—Series of more than 50, with no extreme aberration. A very large specimen from the Champion Collection, taken in the Isle of Wight, August 6th, 1909, has a rather broad black margin to the hind wings adjoining the blue lunules, which are very large and bright.

Aglais urticæ.—Upwards of 120 with several remarkable aberrations. The most striking is one from the Spilsbury Collection with no data. The whole of the ground-colour is creamy-white. A very perfect ab. *ichnusoides* almost exactly corresponding to the figure in Seitz was taken wild in N. Staffs, July 30th, 1918. In another ab. *ichnusoides* taken at Parsonstown, in Ireland, by the Hon. G. L. Parsons, in August, 1886, the black spot of the inner margin is greatly enlarged and prolonged towards the inner angle of the fore wings and the outer portion of the wing is much suffused with a dark shade, thus greatly reducing the red ground-colour. Another remarkable specimen of the same type has the outer margin of the fore wings of what can only be described as a pale mud-colour. It is from the Hope Collection, and is labelled "S. Wales, St. David's, 1876." In two specimens taken wild on two successive days in a garden in the town of Market Drayton, by Mr. H. G. F. Onions, the ground-colour is of a pale ochreous brown, as are also the usually yellow spaces between the black costal spots. A series of five very similar specimens, but with the yellow spaces of the normal colour, was bred by Mr. P. Tautz from larvæ found at Chorley Wood, Rickmansworth, in 1914. Possibly the pupæ of these, as well as the pupæ of the specimens of *V. io* referred to further on, were subjected to abnormal conditions, but the labels attached make no mention of such being the case. Two specimens from Herts, one from Bute and one from Kincardine, make approaches towards the subspecies *A. polaris*, Stgr. From Morthoe, N. Devon, a fine specimen, taken by Dr. F. A. Dixey, F.R.S., August 25th, 1892, very closely approaches the Japanese form ab. *connexa*, Btlr., but there are faint indications of blue spots at the margin of the fore wing.

Vanessa io.—Series of 80, from many English localities and two from Tyrone, with few aberrations. One very remarkable one was taken in the Museum grounds in 1878. The fore wings are normal except that the yellow portion of the interior edge of the ocellus is much reduced in size and the space between the black costal spots is dull ochreous. In the hind wings the normal blue and black centre of the ocellus is reduced to a small black spot set in the middle of a circular patch of very pale ochreous colour. In a series of 10 bred from larvæ found in Chorley Wood, Rickmansworth, Herts, in 1914, by Mr. P. Tautz, the typical red is replaced by a dull maroon or madder-purple colour. The two specimens from Tyrone have a black spot below, but touching, vein 2 in the inner discal portion of the fore wings.

Euvanessa antiopa.—Fifteen specimen. Three from the Hope Collection, and one from Spilsbury Collection, all unlabelled. Another from the Spilsbury Collection is labelled "Bred by the late Mr. Kirby [author of an 'Introduction to Natural History'], given to me by Mr. Dummitt, of Uttoxeter." Another also from the Spilsbury Collection is labelled "Caught by — Farrell, near Macclesfield, September, 1858." A specimen in splendid condition was taken by the Rev. J. W. B. Bell on a sugared post at Pyrton, Oxon. This specimen was recorded in the 'Entomologist,' 1900, p. 250. Two specimens taken at Cromer in late August or early September, 1872, by Miss M. C. and Miss E. H. Lowe, were presented to the collection by Prof. Poulton. A hibernated specimen taken by a boy at Mapledurham in the spring of 1873 was presented to the Collection by Prof. Poulton. A very fine and perfect specimen from the Chitty Collection is labelled "New Forest, 11/6/92." Another from the same collection is labelled "New Forest, 10/8/88. 'Entomologist,' vol. xxi, page 229." A specimen from the Meldola Collection labelled "G. Ruffel, Bigods, Sept. 20, 1900." One from the Sellon Collection, labelled "Worthing, 1879." Another from the same collection labelled "Salwey's Collection, originally from F. Standish's."

Pyrameis cardui.—Upwards of 70, with no noteworthy aberration.

P. atalanta.—No aberration, except one small but apparently very rare, consisting in the absence of the lowest of the normal five subapical spots. It was bred in the New Forest by C. Gulliver, October, 1912.

Argynnis paphia.—Upwards of 80 specimens, including 39 ab. *valesina*, with otherwise no noteworthy aberrations.

A. cydippe.—Upwards of 60 specimens. A beautiful aberration in which the ground-colour is creamy-white, taken in S.W. Bucks by Miss L. B. Evetts, July, 1896.

A. aglaia.—A fine series of more than 80, with much slight variation in the females, some being very dark.

Issoria lathonia.—Eleven specimens. Four from the Hope Collection, each labelled "Wells British Collection." Four from the Spilsbury, without any data. One from the Sellon Collection labelled by Mr. Sellon "Salwey's Collection." Another label, apparently Salwey's original label, has on it, "Folkestone, 1868, presented by T. Briggs, Esq." Two other specimens are labelled "O.E.S." (Oxford Entomological Society).

Brenthis euphrosyne.—Series of 90 specimens. A fine aberration from the Hope Collection without data has the interior portion of all the wings blackish, this coloration extending nearly to the transverse row of submarginal spots. The rest of the wings is much suffused with black. An underside taken May 29th, 1916, near Abingdon, Berks, by the Rev. C. F. Thornewill, entirely wants the normal reddish markings, and the ground-colour is of a very pale ochreous. A specimen of that very rare occurrence, a second brood, taken August, 1899, near Reading, by Mr. W. Holland, is in perfect condition and much below the normal size.

B. selene.—Series of over 100. A fine aberration taken June 11th, 1913, at Crowthorne, Berks, by the Rev. C. F. Thornewill, has a broadish black band in the outer portion of the fore wing along the margin. All the wings are also much suffused with black. A series of 11 specimens of a second brood from the Pogson-Smith Collection was taken near Oxford, August 8th, 1911. They are in perfect condition and much smaller and paler than normal first-brood specimens. Another specimen of the second brood from the Chitty Collection was taken at Dodington, Kent, in August, 1895.

Melitæa cinxia.—Series of 60. One specimen from the Spilsbury Collection, without data, has the row of spots in the central pale band on the underside of the hind wing very large and some of them converted into streaks.

M. athalia.—Series of 63. Mostly from Kent and Sussex, with no remarkable aberration.

M. aurinia.—Series of upwards of 130 from many English localities, six Scottish and one Irish specimen. The series is interesting in showing the slight variation between the series taken in different localities, but there are no very striking aberrations. In a specimen from the Meldola Collection taken at Ivybridge, June 23rd, 1889, and in another without data from the Sellon Collection, the paler ochreous markings are absent and the whole ground-colour of the wings is tawny fulvous. The series of six from Scotland, bred from Oban larvæ, May, 1913, presented by Mr. A. Horne, has the pale markings of a cream colour, giving the series a very striking appearance.

SATYRINÆ.

Melanargia galatea.—Series of upwards of 90. No very remarkable but several minor aberrations. In two specimens from Kent, both females, and one from Northants, a male, on the upper side the outer black band in the hind wing is almost obsolete, only the ocelli being left, which are thus rendered very conspicuous.

Erebia epiphron.—Thirty-eight English from Lake District, 13 from Perthshire, 20 without data. From the Meldola Collection is a specimen labelled "Lake District," but without date, of a unicolorous dark brown = ab. *obsoleta*, Tutt.

E. æthiops.—Series of 24 English, 50 Scotch, 10 without data. No very striking aberration.

Hipparchia semele.—Series of 100. Much variation of a minor character, but none very remarkable.

Pararge ægeria.—Series of upwards of 70.

P. megæra.—Upwards of 60.

Epinephele jurtina.—Series of upwards of 100, with several striking aberrations. Two females, one from the Meldola Collection, taken in the New Forest, the other from the Pogson-Smith Collection, taken at Nettlebed, Oxon, have the fulvous subapical blotch on the fore wing white instead of the usual fulvous. A very remarkable female taken September 1st, 1891, by Mr. W. Holland, has nearly the whole of the right fore wing bleached, but retains in the bleached portion traces of the fulvous subapical blotch of the normal colour. In the left fore wing only the apex is bleached. In both the ocellus is reduced to a white spot surrounded by a very narrow ring of black. On the right hind wing is an oblique bleached stripe from the middle of the costa to the anal angle. From the Meldola Collection is a very beautiful symmetrically bleached female taken near Romford, Essex, in July, 1895. Towards the apex of the fore wing is a large irregularly-shaped white blotch of similar size, shape and position, on each wing. Both hind wings have the central portion of the wing bleached, with a narrow margin of normal colour running completely round the wing. There are seven other specimens with partial bleaching of the wings.

Epinephele tithonus.—Series of 70. Six specimens have supernumerary black spots on the fore wings. One from the Chitty Collection, labelled "New Forest, 1890," has the outer margin of the right fore wing bleached, and the central dark band is almost obsolete. The left fore wing is normal except that the outer marginal band is very light brown. From the Champion Collection, labelled "Woking," is a remarkably dwarfed male.

Aphantopus hyperanthus.—Series of 95. Two undersides, one from near Bude, the other from the New Forest, are asymmetrical on the undersides, having three ocelli on one fore wing and only two on the other. A fine specimen of ab. *arete*, Müll., was taken by Mr. F. A. Dixey in Darenth Wood, July 17th, 1876. Two other specimens of ab. *arete*, one from the Hope, the other from the Spilsbury Collection, are without data.

Cœnonympha tiphon.—A series of over 50 Scotch specimens and 54 English = ab. *rothliebii*, with 18 unlabelled, mostly English, from the Hope and Spilsbury Collections. The English specimens show a very great range of variation of the size of the ocelli on the underside.

C. pamphilus.—Series of over 80, with no remarkable aberration.

Nemeobius lucina.—Series of 80.

LYCÆNIDÆ.

Zephyrus betulæ.—A long and fine series chiefly from Devon, Hants and Oxford, in all about 80, with only one remarkable aberration. This is a male specimen from the Spilsbury Collection in which the white line on underside of the fore wing is entirely wanting, as is also the outer white line of the hind wing. It has no data.

Z. quercus.—A fine series of upwards of 60, mostly bred chiefly from Devon, Hants and the New Forest. There are two indications of aberration, and both seem to be pathological. One is a ♂ bred by myself in the New Forest, and the other, unlabelled, from the Meldola Collection. In both the aberration is in one of the hind wings. A large proportion of the normally blue scales are white, giving a rubbed appearance, but a lens shows that this is not the case. In the New Forest specimen the aberration is on the right side, in the other on the left. In both specimens the shape of the affected wing is abnormal, the edge of the wing from the angle to the tail being straight instead of curved.

Thecla pruni.—Thirty specimens, labelled, from Northants, Huntingdon and Oxford. Twenty, unlabelled, from the Hope, Spilsbury and other Collections.

T. w-album.—A series of 45. Thirty, with data, from several localities.

Callophrys rubi.—A long series of upwards of 100. One underside from Cumberland, with a row of white spots in the fore as well as in the hind wings. Another has the underside altogether spotless; this is from Cornwall.

Chrysophanus dispar.—A very fine series of 27—14 male, 13 female. Most of them are in perfect condition, even with respect to antennæ. With them are two ichneumons, labelled by Prof. Westwood as "ichneumons of *C. dispar.*" The species has not yet been determined.

C. virgaureæ.—A specimen, not in very good condition, from the Hope Collection, is the one referred to in Humphreys and Westwood's edition, 1841, p. 98, and has a label to that effect by Prof. Westwood: "I possess a specimen given me by the late Mr. Haworth as an undoubted native specimen."

C. phlæas.—A fine varied series of upwards of 150 from many localities. The chief aberrations are two ab. *alba*, Tutt, one taken near Oxford by Mr. W. Holland, the other from N. Staffs taken by myself. An ab. *eleus*, unlabelled, from the Spilsbury Collection, and another ab. *eleus*, from the Champion Collection, labelled "Milford, Surrey, July 29th, 1908." A very remarkable ab. *suffusa*, Tutt, taken in N. Staffs by Mr. H. E. F. Onions, August 5th, 1918. In this specimen the normal bright red of the fore wing is replaced by a pale buff colour along a narrow subcostal strip embracing the discal spots. The rest of the wing is deeply suffused with dark fuscous. In the hind wing the usual red band is buff coloured and much reduced in length and breadth. A very similar specimen, except that the ground-colour is more normal, was taken in the same locality, 1917, by myself. A fine ab. *radiata*, Tutt, Woking, August 13th, 1912, is from the Champion Collection, as is also a very fine ab. *juncta*, Tutt, taken near Woking. It approaches ab. *kochi*, two of the upper spots of the transverse set being elongated. There are also in the series several specimens of ab. *magnipuncta*, Tutt, ab. *parvipuncta*, Tutt, and ab. *intermedia*, Tutt, from various localities.

Plebeius ægon.—A long series of upwards of 100, but with very few aberrations. A series of 12 ab. *masseyi*, Tutt, from Witherslack. A remarkably dwarfed female specimen from the Meldola Collection, taken in Surrey, is no larger than a normal *Cupido minimus*.

Aricia medon.—A long series embracing all three forms—*medon*, *salmacis* and *artaxerxes*. One ab. *artaxerxes* is labelled "Durham, Castle Eden, capt. July 25th, 1893, by T. Maddison." In three specimens of ab. *artaxerxes* from Kincardine there is a black spot in the subterminal row of ocelli of the fore wing.

Polyommatus icarus.—A series of upwards of 190 from many English localities and from Scotland and Ireland. There are two ab. *icarinus* and three others closely approximating to that form. A remarkable pale lilac male, ab. *pallida* Tutt., from the Sellon Collection, is labelled "Grut's Collection." Two females are entirely blue except at the outer margins. Other female aberrations are too numerous for description.

Agriades bellargus.—A series of 67, all normal.

A. corydon.—A long series of upwards of 150. Two ab. *syngrapha* from Princes Risboro', 1917, taken by L. W. Newman. Ten *semi-syngrapha* taken at Royston, 1917. One ab. *corydonis*, Bergst., Princes Risboro'. Two female undersides, ab. *obsoleta*, also from Princes Risboro'. Another female ab. *obsoleta*, taken by Prof. Poulton near Reading about 1893. The above are the principal aberrations.

Celastrina argiolus.—A long series of upwards of 100, well illustrating the season dimorphism. The aberrations are few except in the size and number of spots on the underside, but there are two pinkish lilac males, ab. *lilacina*, Tutt, unlabelled, from the Spilsbury Collection. Also a female ab. *lilacina* from the Meldola Collection, but the usual black borders are light brown. Taken at Deal, August, 1901. A very remarkable male underside was taken by myself in the New Forest May 8th, 1915. The fore wings are spotless except for the central lunule, which is very faint, but in the hind wings the spots of the marginal row are elongated into streaks. In Tutt's 'British Lepidoptera,' vol. ix, pl. xviii, fig. 10, exactly represents the hind wings of this specimen, but has also the fore wings with spots and streaks. It is named *subtus-radiata*, Obth. This specimen might be described as ab. *subtus-partim-radiata.* A very minute female, smaller than many specimens of *C. minimus*, was taken by Prof. Poulton, August 6th, 1896, at St. Helens, Isle of Wight.

Cupido minimus.—A series of upward of 70 without any noteworthy aberration.

Nomiades semiargus.—A series of 12, most in very good condition, 5 from the Hope Collection, 4 from the Spilsbury, and 3 labelled "Grut's Collection" from the Sellon Collection.

Lycæna arion.—A series of 119 Twenty-nine from the Bude District, taken by myself, 41 also from the Bude District, taken by Mr. B. G. Adams, 29 from the Cotswolds in the Pogson Smith Collection. The rest without data. Except in the number and size of the spots the aberration is small. A male in the Pogson Smith Collection has only two submedian spots in the fore wings, and no spots in the hind wings. Of the small race there are 4 from Bude (2 males, 2 females), 3 from the Cotswolds (2 males, 1 female), 3 from the Hope Collection and 1 from the Spilsbury, the last 4 being all males.

HESPERIIDÆ.

Hesperia malvæ.—Series of upwards of 80. One specimen from the Sellon Collection labelled "Winchester" has an unspotted hind wing. Fourteen specimens exhibit every degree of modification from the type to the fully developed ab. *taras.* Of the remaining species of the Hesperiidæ it need only be stated that all are well represented in the normal forms.

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SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

By F. C. Woodforde, B.A., F.E.S.

SPHINGIDÆ.

Dilina (*Mimas*) (*Smerinthus*) *tiliæ*.—Series of over 70, showing a great range of variation both in marking and coloration. In marking the variation lies chiefly in the central dark marks in the centre of the fore wing. In some specimens these are united to form an unbroken band, in others this band is broken up into three separate blotches, in others reduced to two, and in a few to one blotch, this lying in the central portion of the wing. Four specimens are asymmetric in marking. The coloration ranges from a greyish pink to almost white in the ground-colour of the central portion of the fore wing in the males, and over many shades of red-brown in the same part of the wing in the females. In two males from Reading, one taken wild, one bred in 1894, the ground-colour is almost white.

Smerinthus (*Amorpha*) *populi*.—A very fine varied series of 60. A remarkable series of 8 was bred by Mr. A. H. Hanm in 1900 from ova deposited by a female which was brought to the Museum in June. The larvæ fed up very quickly, and the moths emerged as a second brood between July 25th and July 30th. They are small. Six are of a very pale whitish-grey colour, with very faint markings. Two are almost unicolorous pale buff.

S. ocellatus.—A series of 42 without any remarkable aberration. There are 5 hybrids, *populi-ocellatus*. One is from the Hope Collection, two from the Spilsbury, all three without data. Two were bred in Kent by Mr. J. W. Newman in 1917, the male parent *S. populi*, the female parent *S. ocellatus*. All five are remarkably similar in colour and marking.

Acherontia (*Manduca*) *atropos*.—A fine series of 22, with full data.

Sphinx convolvuli.—Series of 29.

S. pinastri.—Three specimens, one from the Hope Collection, rather worn, without data, two from the Chitty Collection, labelled "*Ex* Coll. Haslehurst."

Phryxus (*Deilephila*) *livornica*.—Five specimens, one from the Spilsbury Collection, labelled "From Coll: of late Hugh Harrison of·Bowden. Said to have been taken near Manchester, bought by me through Mr. Hodgkinson fr: Mr. Brockhoules' Coll: 1875. F.M.S." One from Reading, taken July 24th, 1870, by Prof. Poulton. One from the Sellon Collection, labelled "Fr: Burnell's Coll: This specimen was caught at Fifield, Berkshire, June 1884 by Mr. Micklem." One from the Meldola Collection, labelled "Dorset 1906. Canford Cliffs. June 4. 1906." One from the Spilsbury Collection, without data.

Hippotion (*Chærocampa*) *celerio*.—Four specimens. One from the Spilsbury Collection, labelled "Taken at Wakefield. fr: Coll: of Mr. Harrison, next of Mr. Brockhoules', thro' Mr. Hodgkinson." It is in perfect condition. One from the Meldola Collection, labelled, "In house: Hurstpierpoint, Sussex. Sept. 12th 1885. Given to Wm. Mitten and by latter to W. G. Wallace 1885. To R. Meldola from latter in 1914. (Jan. 11th)." In perfect condition. One from the Hope Collection—a mere fragment—without data. Another specimen from the Spilsbury Collection; much damaged.

Deilephila euphorbiæ.—Four specimens. Two from the Hope Collection, one of them being labelled "Wells Coll." Two from the Spilsbury Collection, one of them labelled "*Euphorbiæ* fr: coll: of Mr. Harrison, bt: fr: late Peter Bouchard Esq. who had it fr: Coastguard's man. Then in Colln: of Mr. Brockhoules, bt: by Mr. Hodgkinson fr: him."

D. galii.—Eleven specimens. Three from the Hope Collection, labelled "Wells Brit. Coll." Two from the Spilsbury Collection without data. Three from the Sellon Collection, labelled "Vaughan's Coll." On one a further label has "S. J. Capper. 1876." A fourth specimen from the Sellon Collection is labelled "Bennett's Coll." and a fifth "Burnell's Coll."

Daphnis (*Chærocampa*) *nerii*.—Two specimens. One from the Hope Collection, a female, very old and faded, but otherwise perfect. One from the Chitty Collection, both without data.

Metopsilus (*Chærocampa*) *porcellus* and *Chærocampa elpenor*. —Long series of each species, but without any noteworthy aberration.

Macroglossa stellatarum.—Long series. Two from Chitty Collection, with dark brown hind wings, with no data.

Hemaris fuciformis and *tityus*.—Long series without aberration. Three specimens of *fuciformis*, freshly emerged, show many scales on the wings.

Dicranura bicuspis.—Series of 25. Nine from Tilgate Forest, Sussex, 9 from North Staffs. taken by myself, 1 from Shifnal, Salop, 5 unlabelled from Spilsbury Collection, 1 unlabelled from Hope Collection.

Stauropus fagi.—Series of 31. Five specimens taken in 1892 were originally melanic, but are now faded to very dark brown. This also applies to a remarkably fine female labelled "Marlow," bred by the late Canon Barnard Smith.

Drymonia trimacula and *chaonia*.—Fine series of both species. One specimen of the latter from the Pogson Smith Collection, bred from a larva taken in Bagley Wood, has the central band entirely filled up with the dark ground-colour, and the white lines bounding it are very indistinct.

Notodonta phœbe = *tritophus*.—There are two specimens without data from the Hope Collection. Both are in perfect condition.

Lophopteryx cuculla.—Series of 16. Ten labelled "Marlow," eight of which are from the Sellon Collection.

Odontosia carmelita.—Series of 17. Seven from the Sellon Collection, labelled "Sussex." One from the Champion Collection, bred April 17th, 1910, from a larva taken at Chobham in September, 1909.

Ptilophora plumigera.—Series of 27. Only six with data, three of which are from Bucks, three from Kent.

THYATIRIDÆ.

Palimpsestis duplaris.—A long series from various localities. Eleven melanic specimens from Staffs.

Polyploca ridens.—A specimen without data from the Spilsbury Collection has the basal and outer portions of the fore wing white.

LYMANTRIIDAE.

Lælia cœnosa.—Series of 35 from various collections. One female from the Meldola is labelled "Burwell Fen. Dr. W. Horley."

Ocneria dispar.—A long series from the Hope and Spilsbury and more modern collections, some of them apparently of great age. Three males from the Spilsbury Collection have the inner and central portions of the fore wing nearly filled with whitish, with a dark narrow band along the outer margin. A small, seemingly very old male has all the wings of a dingy white.

Lymantria monacha.—A series of 6, bred by Mr. C. Rippon from New Forest parents, have the abdomen banded with pale yellow instead of the normal pink. The fore wings are suffused with black to an abnormal extent.

LASIOCAMPIDÆ.

Pachygastria trifolii.—Two specimens from the Hope Collection came from F. Bond's Collection. They were bred in August, 1871, from larvæ taken in Romney Marsh, Kent. They are described in the 'Proceedings of the Entomological Society,' November 20th, 1871. They are very pale brown on the inner portion of the fore wings, the outer portion being ochreous.

Lasiocampa quercus.—A very remarkable specimen from the Hope Collection, which has the body and wings of a female with male antennæ, also came from F. Bond. It is labelled "May, 1867, larva found in the London District." On another label is "Mr. F. Bond."

Macrothylacia rubi.—In a male specimen from the Hope Collection the two pale lines are widened and drawn close together, making a pale band, only showing indications of the dark inner band at the costa and inner margin. In two other specimens taken by myself in North Staffs by assembling, and in one from the Meldola Collection from Morpeth, the two pale lines are much nearer to each other than is normal. In two others, one bred by myself from a New Forest larva, the other from the Chitty Collection, also from the New Forest, the inner pale line is obsolete.

Gastropacha ilicifolia.—Two specimens from the Spilsbury Collection without data. One from the Sellon Collection, labelled "Cannock Chase by Orgill of Rugeley." It is rather faded and the antennæ are wanting, but is otherwise in very fair condition.

DREPANIDÆ.

Drepana falcataria.—Five ab. *pallida*, White.

D. harpagula = sicula.—Six specimens, four presented by Mr. G. C. Griffiths, bred by him from larvæ beaten in the Leigh Woods, Bristol, 1895, 1896 and 1899. One from the Meldola Collection, labelled "Leigh Woods, Bristol bred 6. 1899." One from the Sellon Collection, without data.

D. lacertinaria.—Several ab. *scincula*, one of them from the Hope Collection being a Haworth specimen and labelled by him "*scincula*."

NOLIDÆ.

Nola strigula.—Six from the Sellon Collection, New Forest; 5 from the Meldola Collection; 4 from Sussex, Abbot's Wood; 1 Kent, Darenth Wood; 1 from the Pogson Smith Collection, labelled "Oxford district, July 1897."

N. confusalis.—Two specimens of ab. *columbina*, Selwyn Image, from Epping Forest. One of them is one of the two specimens exhibited at a meeting of the Entomological Society, June

6th, 1906, and reported in the 'Proceedings of the Entomological Society' of the same date. The other is from the Meldola Collection, taken in Epping Forest, May 30th, 1908. This variety was first described in the 'Entomological Record,' vol. xvii, p. 188.

N. albulalis.—Long series, but only eight specimens with data. These are from the Meldola Collection, labelled "Kent. Chattenden," without date.

N. centonalis.—Eight specimens. One from the Meldola Collection, labelled "Deal. 1881/3. Rt. Adkin." One specimen in each series of *N. cuculatella, strigula* and *confusalis* are Haworth specimens, and each is labelled with its name in his writing.

N.B.—Haworth's specimens are recognisable by a special label.

SARROTHRIPINÆ.

Sarrothripa revayana.—Series of over 100, including almost every possible variation. By far the greater number are from the New Forest. By the kindness of Mr. South several of the forms have been identified and named.

ARCTIIDÆ.

Spilosoma menthastri.—In a long series from Perthshire, bred and presented by Mr. T. M. Marshall, the fore wings are of varying shades of pale buff. From the Meldola Collection is a very dark buff form from Glasgow. A female from North Staffs, bred by myself last year, is asymmetric, the right fore wing having less than half the number of spots that there are on the left. The right hind wing has only one very small submarginal spot, while the left has two. In both hind wings the central spot is obsolete. From the Hope Collection is one of Haworth's specimens, labelled by him *S. lubricipeda.* The series contains 14 ab. *radiata* and 9 ab. *zatima.*

Diaphora mendica.—Six specimens bred by Mr. L. W. Newman are six hybrids, between the type and ab. *rustica.* The males are pale greyish-buff. In a series of 16 bred from ova obtained by me from Mr. L. W. Newman in 1916, together with the two parents, the males, except one, which is rather pale buff, are of true *rustica* type. From two of this brood another generation of 17 specimens was reared. The male parent was of the true *rustica* type, but 3 of the male offspring resembled the hybrid males alluded to above, the 6 other males being true *rustica.*

Phragmatobia fuliginosa.—In 3 females from the Champion Collection, bred from larvæ taken near Woking, and a female from the Meldola Collection, taken in North Cornwall, the fore wings are dark and the hind wings show only a very narrow red border along the inner margin, and closely resemble var. *borealis.*

A series of 6 var. *borealis* from Aberdeenshire was presented by Mr. A. Horne.

Parasemia plantaginis.—In a striking series of 18, taken wild near Cerne Abbas, Dorset, by Dr. R. C. L. Perkin, and presented by him, the paler markings predominate over the black. This is particularly noticeable in the females, five of which have remarkably small proportion of black in the fore wings. A specimen from the Sellon Collection has a female body and markings, but the right antenna is female and the right male. It is labelled "Hermaphrodite (Harwood)."

Diacrisia sanio.—A male taken in N. Staffs by myself in 1917 is almost entirely wanting in the black border of the hind wings, this being slightly indicated by a few greyish scales. A female taken in the same locality has almost the whole of the hind wing filled with black, only two small rufous spots being left.

Arctia caia.—A long series showing a great deal of minor variation. There is one very remarkable aberration of a female from the Spilsbury Collection. Except for a few very small white spots which do not correspond with each other on each side the whole of the forewings are filled up with very dark brown. On this dark brown ground are black markings exactly corresponding with the usual white markings of a normal specimen. The hind wings have a very broad blue-black border, with a broad dark central band. From the Hope Collection is a female with normal markings, but with lemon-coloured hind wings.

Callimorpha dominula.—One from the Chitty Collection taken in S. Devon has the two spots near the anal angle of the hind wings coalescent, with much blackish suffusion towards the centre of the wing, resembling a smudged ink-blot. A series of 10 fine bred ab. *rossica* from Kentish stock (from L. W. Newman).

Coscinia striata.—Two specimens, both from the Hope Collection. One of them has a label "Wells Brit. Coll." Neither of them is in perfect condition.

C. cribrum.—Varied series of over 60, mostly from Ringwood. Six from the Meldola Collection, labelled "Canford, Dorset."

Deiopeia pulchella.—Six specimens. One from the Sellon Collection, on an old common pin, labelled "Standen's Collection"; another label, apparently Standen's, has on it "Taken by Dr. Battersby at Torquay." A second from the Sellon Collection has a label "Folkestone, –/8/84 taken by V. R. Prince." Two from the Spilsbury Collection, one labelled "from Mr. Brockhoules' Collection, Westmoreland, bred by the Revd. — Tristram. ♀. caught at Torquay, which laid 14 eggs. From Mr. Hodgkinson." Two from the Hope Collection with no data.

Hipocrita jacobææ.—Two specimens have yellow hind wings and a yellow stripe and spots on the fore wing. One is from the Hope Collection. The other from near Southampton, taken about 1889 by the Rev. G. Hughes.

Cybosia mesomella.—A male and two females from the Hope Collection are Haworth specimens. The male has yellow fore wings, and is labelled by him "*eborina.*" One of the females is labelled, also by him, "*flavescens.*"

Lithosia deplana.—A fairly long series with considerable variation. A very large female from the Sellon Collection, taken in the New Forest, and another from the Meldola Collection taken at Horley, Surrey, have very dark greyish-brown fore wings with a strong dark yellow stripe along the costa extending to the apex, the hind wings being darkish grey. Two females from the Meldola Collection taken at Boxhill have rather bright yellow forewings (resembling pale specimens of *L. sororcula*) with paler hind wings. From the Hope Collection is a Haworth specimen labelled by him "*helvola.*"

L. griseola.—A Haworth specimen is labelled by him "*ochreola.*"

L. griseola, ab. *flava.*—There are two Haworth specimens, one of which is labelled by him "*flava, F.*"

Lithosia sericea.—Six specimens from Warrington. Four others from Chitty and Sellon Collections, unlabelled.

L. caniola.—A long series from S. Devon. One pure white = ab. *lacteola*, Boisd., a female, was taken by myself last August near Paignton. From the Meldola Collection are three specimens labelled "Romney Marsh 1895."

Lithosia sororcula.—A Haworth specimen labelled by him "*Aurantina.* Pr."

Pelosia muscerda.—Two of the specimens from the Meldola Collection are labelled, one "Eastry, Kent, 1903," the other "Kent 1907."

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NOCTUIDÆ.

Acronyctinæ.

Acronycta leporina.—A long series of ab. *bradyporina*, Tr., from various localities. A very dark specimen ab. *melanocephala*, Mansbridge, from North Staffs. There are three specimens without data of true *leporina*, one from the Hope and two from the Spilsbury Collections.

A. aceris.—A specimen of ab. *infuscata*, Haw., from the Spilsbury Collection, without data.

A. alni.—Series of 25, 13 of them with data. One from the Hope Collection is labelled with a reference to the 'Entomologist Intelligencer' of 1856, p. 108. Three N. Staffs bred specimens show a decided tendency towards melanism.

A. strigosa.—Series of 22. Two are labelled "Cambridge Fens, July, 1890, presented by W. Holland." Another from the Meldola Collection is labelled "Cambridge," but without a date.

A. auricoma.—Six specimens. One from the Meldola Collection is labelled "Sussex, 1894."

A. rumicis.—Two specimens of ab. *salicis* from N. Staffs, and one from Yorks from the Sellon Collection.

A. ligustri.—Series of upwards of 30, mostly with full data. Three ab. *coronula* taken near Oxford, from the Pogson Smith Collection, and one without data from the Hope Collection.

Arsilonche albovenosa.—Nineteen specimens. Six labelled "Cambridge." The rest without any data.

Bryophila perla.—Series of more than 100 with full data, among them a very beautiful yellow specimen taken in the Isle of Wight by the late Capt. R. W. Poulton. A series of more than 20 from the Meldola Collection, from various parts of Scotland, are larger and more strongly marked than the average of English specimens.

B. muralis.—A long and very varied series with full data from S. Devon, Wiltshire, Isle of Wight and Sussex.

B. impar.—Six specimens from Cambridge presented by Mr. J. Peed.

TRIFINÆ.

Agrotis segetum.—A long series with some fine aberrations.

A. vestigialis.—In the series are eight specimens taken near Oxford, at an inland locality in which it regularly occurs. They differ slightly from the type.

A. cinerea.—A very varied series of about 40, all but one males. Two specimens from Wyre Forest have a brownish ground colour.

A. cursoria, *A. nigricans*, *A. tritici*, *A. aquilina*, *A. exclamationis*, *A. upsilon*, *A. ripæ.*—Long series of each of these species exhibiting almost every form of variation.

A. obelisca.—Series of 40 from Devon, Isle of Wight and Purbeck.

A. præcox.—Series of 34, 17 with data, from the Isle of Wight, Cheshire and Lancashire.

A. simulans.—Seventeen specimens. Six from the Meldola Collection with data, viz. 4 Aberdeen, 1 E. Lothian, 1 Portland. The others without data.

A. agathina.—Series of 50 from Somerset, Dorset, Hants, Surrey and Carnarvonshire.

A. obscura.—About 30—6 Oxford, 3 Yorks, 3 Essex. The rest without data.

A. hyperborea.—A varied series with full data. Twenty-three from Rannoch, 1 from Shetland.

A. ashworthii.—Twenty-eight from Penmaenmawr with full data. Nine without data from the Hope and Spilsbury Collections. One of the Hope specimens is labelled "H. Doubleday."

Noctua subrosea.—Twelve specimens. Three or four of them are in bad condition; the rest more or less worn.

N. flammatra.—A specimen from the Sellon Collection labelled "Cummings Collection."

A. glareosa.—A long series from many localities in England and Scotland.

N. castanea.—A long series of grey and red forms, both English and Scotch. There are two specimens of a pale ochreous yellow approaching var. *xanthe*, Wdfde., both from the Burnt Woods, N. Staffs. One was presented to the Collection by the Rev. G. Hughes, the other by the Rev. C. F. Thornewill.

N. depuncta.—Fifteen specimens, but only three have data. One from near Reading, taken by Mr. W. Holland. Another from the Meldola Collection labelled "Exeter, 29 . 7 . 02." A third from Forres.

N. ditrapezium.—Twelve with data. Four of them from Brighton; the others from Scotch localities.

N. primulæ.—A long series from English localities. Twenty-nine var. *conflua* from Aberdeenshire, Ross-shire and Nairn. Two var. *thulei* from Shetland, presented by Commander J. J. Walker.

N. dahlii.—Series of 8 from the New Forest, 12 from N. Staffs, 22 from various Scotch localities.

N. sobrina.—Series of 20 from Aberdeenshire.

Triphæna orbona (subsequa).—Series of 30 with full data from Dorset, the New Forest and Canterbury.

T. comes.—A long series, including more than 20 of the dark Scotch forms. A remarkably fine specimen of var. *rufa*, Tutt, taken by myself in N. Staffs, is as dark as any Scotch example.

Eurois occulta.—Fifteen specimens from Scotland with full data. Two taken in Essex, August, 1869, from the Meldola Collection, are recorded in the 'Entomologist,' vol. iv, p. 325.

Aplecta tincta.—A fine series with full data, mostly from N. Staffs and Scotland.

A. nebulosa.—A long and very varied series. Eight ab. *robsoni*, 4 of which were presented to the Collection by Mr. B. H. Crabtree and 4 by Messrs. Main and Harrison. Four ab. *thompsoni* were also presented by Messrs. Main & Harrison and 1 by Mr. B. H. Crabtree.

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Mamestra contigua.—Ten with full data from Surrey, from the Champion Collection. A very fine dark specimen labelled "Rannoch" from the Tautz Collection (bought at Stevens).

M. glauca.—Seven with full data from Staffordshire. Twenty from various Scotch localities; 6 of them, from Aberdeen, presented by Mr. A. Horne.

Dianthœcia barrettii.—A very varied series of over 50 with full data. Of these 23 were bred by myself from larvæ found in the Bude district on *Silene maritima*, and 16, also bred by myself, from larvæ found on *S. maritima* in S. Devon. Five specimens from S. Ireland bred by Mr. L. W. Newman. One of the Bude specimens has a distinctly ochreous tinge.

D. cæsia.—Series of 19, 12 with data, from Douglas, Isle of Man.

D. conspersa.—Series of over 50 from various localities in England, Wales and Scotland, with full data. Two specimens in a series of 10 bred from Carnarvonshire larvæ approach the dark Shetland form *hethlandica*, Staud., of which last there are 5.

D. albimacula.—Eighteen with data; 16 from Folkestone, 2 from S. Devon.

D. carpophaga.—A fairly long and varied series with full data. Twelve ab. *capsophila* from the Isle of Man.

Dianthœcia irregularis.—Five from Cambridge, presented by Mr. E. D. Bostock. Twelve from Suffolk, presented by Mr. B. H. Crabtree.

Hecatera chrysozona.—Nineteen specimens, but only one with full data. This is from the Meldola Collection, and labelled "On post, Darenth Wood, 12 . 7 . 73"

Neuria reticulata.—Series of 40, mostly from Dorset and Suffolk. The rest from various localities.

Pachetra leucophœa.—Series of 28 with data. All from Wye, Kent, except two labelled "Mickleham, Surrey, July 14, 1856."

Xylomyges conspicillaris.—Series of 20, mostly var. *melaleuca*, Vieweg. Fifteen labelled "Taunton." Two from the Chitty Collection labelled "Wales 1888." One from the Meldola Collection labelled "Worcester."

Eumichtis satura.—This rarity is represented by one specimen from the Sellon Collection labelled "*H. satura*, Oxford, Harper's Collection." It is possibly the specimen referred to in 'Barrett,' vol. iv, p. 113.

Crymodes exulis.—Six specimens, five with data. Three from the Meldola Collection are labelled "Rannoch." One, in poor condition, from the Sellon Collection, is also labelled "Rannoch." Another presented by Mr. J. Peed, by whom it was taken, is labelled "Unst. July 23–31, 1914."

TRIFINÆ.

Eremobia ochroleuca.—Series of 40, 26 of which have data. Twenty-five are from Kent and Essex. One from the Champion Collection is labelled "bred Guildford."

Trachea atriplicis.—Twenty-seven, most of them from the older collections and without data. Two from the Norgate Collection, presented by Mr. B. H. Crabtree, and three from the Meldola Collection are labelled "Cambridge."

Valeria oleagina.—A single specimen, slightly damaged, from the Hope Collection. This is probably the specimen taken July, 1800, by Mr. Donovan near Fishguard, in Pembrokeshire. See 'Barrett,' vol. iv, p. 330.

Luperina testacea.—From the Meldola Collection. Is a very dark brown specimen, almost black, in which usually markings are almost invisible. It is labelled "Lancs, St. Anne's-on-Sea, bred 17 . 8 . 12."

L. guenéei.—Over 40 with full data from St. Anne's-on-Sea.

L. dumerili.—A specimen from the Spilsbury Collection without data.

Hama abjecta.—Thirteen with full data from Hants, Kent and Essex.

H. furva.—Nineteen with data. A series of 7 from the Meldola Collection labelled "Surrey, Banstead, 7.04." The rest from Scotland.

Apamea pabulatricula (*connexa*).—Twenty-four, 4 with data. Three from the Sellon Collection labelled "Sheffield, 1890"; 1 from the Meldola, "Barnsley, 1890, Maddison."

A. ophiogrammea.—Nineteen with data from Surrey, Cambs, and Middlesex.

Aporophyla lutulenta.—Thirty-three with data. Two var. *luneburgensis* from Scotland. Two var. *sedi* without data from the Spilsbury Collection.

Polia xanthomista.—Twenty-four with data. Of these 2 are from N. Devon, taken by Dr. Dixey—one September 15th, 1890, recorded in the 'E. M. M.,' 1893, p. 87; the other September 28th, 1898. Of the rest 8 are from N. Cornwall; 14 from the Isle of Man; 6 presented by Mr. E. D. Bostock; 2 from the Meldola Collection; 6 from the Robertson Collection (bt. Stevens).

Trigonophora flammea.—Twenty-three, 10 of them with data. One from the Hope Collection is labelled "Bramber Castle." One from the Meldola Collection, "Sussex, Balcombe Wood, Octr. 24, 1871"; others from the same collection, "Sussex, Lewes." Four from the Champion Collection, "Sussex, 187?."

Hydræcia lucens.—Twenty-three with data from Lancs, the Lake District and N. Staffs.

H. paludis.—Fourteen, all from the Meldola Collection; 8 labelled "Sussex, Bognor"; 4, "Kent, Deal"; 2, "Lancs, St. Anne's."

H. crinanensis.—Eight specimens. Two from the Meldola Collection labelled "Inverau, fr. L. W. Newman." Six from "Near Thursby, Carlisle, Aug., 1920, examined and certified by the Revd. C. R. N. Burrows." Presented by the Rev. H. D. and Mr. E. B. Ford.

Nonagria cannæ.—Twelve with full data, all from Norfolk.

N. sparganii.—Sixteen with full data. Three of them are from the Meldola Collection, one of them being the specimen taken in Deal in 1884, mentioned in 'Barrett,' vol. v, p. 83, and recorded in 'Entom.,' 1884, p. 253; and in 'E. M. M.,' 1884, p. 135.

Senta maritima.—Twenty-seven with data. Six from Whittlesea, presented by Mr. J. Peed. Eighteen from the Robertson Collection (bt. Stevens), which include 2 var. *bipunctata* and 2 var. *wismariensis*.

Tapinostola extrema.—Twelve with full data from Northants and Huntingdon.

Synia musculosa.—Two from the Spilsbury Collection without data.

Leucania favicolor.—Three specimens. One from Sheppey, presented by Commander J. J. Walker. Two from the Meldola Collection, labelled "N. Kent, 1911."

L. obsoleta.—Five with data. Three from the Meldola Collection, labelled "Ely." One from Whittlesea, presented by Mr. J. Peed. One from the Champion Collection, labelled "Ely."

L. brevilinea.—Twelve with data. Three v. *sinelinea*, Farn.

L. putrescens.—Twenty-one with data, all from Torquay.

L. unipuncta (*extranea*).—Two specimens. One from the Meldola Collection, labelled "Walmer, 1 . 9 . 78," recorded in 'E. M. M.,' 1878, p. 107, and mentioned in 'Barrett,' vol. v, p. 163. One taken by the Rev. G. Hughes in the New Forest, 8 . 10 . 96, recorded in 'Entom.,' 1896, p. 333.

L. vitellina.—Four with full data. Three from the Meldola Collection, taken in Sussex, and one from S. Devon.

L. albipuncta.—Eight with full data. Six from the Meldola Collection; 4 taken in Sussex, 2 in Kent, and 2 from S. Devon, taken by the Rev. G. Hughes.

L. turca.—A long series from the New Forest.

Caradrina exigua.—Seventeen with full data, most of them from S. Devon.

Acosmetia caliginosa.—Seventeen specimens, but only 4 with data, from the Meldola Collection, labelled "New Forest, 1877–78."

Pachnobia leucographa.—Twenty-one specimens, 6 with data, from Wales, Surrey and Yorks.

Tæniocampa gothica.—A long and very varied series, with full data, including several v. *gothicina* and intermediate forms.

T. incerta.—A long and interesting series. A very remarkable aberration from the Spilsbury Collection, without data.

T. opima.—Sixteen with full date. Five from Wyre Forest taken by myself. Four labelled "Lewes" from the Sellon Collection. Seven from the Meldola Collection, labelled "Lancs, St. Anne's-on-Sea."

T. gracilis.—A long series, including 40 specimens of var. *rufescens*, Cockerell, from the New Forest, bred by myself. These show a very great amount of variation in colour, from light greyish pink to very dark brown.

Dicycla oo.—Fifteen specimens with full data, including 5 var. *renago*, Haw.

Calymnia pyralina.—Thirty-seven with full data from S. Wales, Surrey and Middlesex.

Cosmia paleacea.—Five specimens with data. Four from the

Champion Collection, labelled "Sherwood Forest, 1872." One from the Meldola Collection, labelled "Ross-shire, Fortrose, 1903, found in a spider's web."

Plastenis retusa.—Sixteen specimens with data from various localities.

P. subtusa.—Twenty-one specimens with data.

Cirrhœdia xerampelina.—Four specimens with data. One from Cornwall, one from Oxford, one from Cambridge, and one labelled "Wales, 1888."

Ochria aurago.—A series of 40 with full data, showing much colour variation.

Mellinia ocellaris.—Five specimens with data. One from the Meldola Collection, labelled "Twickenham, Sept., 1893. 'Barrett,' vol. v, p. 397." The other 4 are also from the Thames Valley.

Orrhodia erythrocephala.—Three specimens, of which two are from the Spilsbury Collection with no data. The third from the Carden Collection (bt. Stevens, 1919), is labelled "Kemp-Welch Collection."

O. rubiginea.—Fifty specimens with full data, nearly all bred specimens, from various collections. One from the Meldola Collection is of an almost uniform brown without the usual irroration.

Lithophane semibrunnea.—Twenty-one with data. Ten from near Oxford, 4 from Cambridge, 3 from Hants, 4 from Surrey.

L. socia.—Over 30 specimens. One from Cornwall, 8 from Devon, the rest from Hants.

Graptolitha furcifera.—Two from the Spilsbury Collection. Four from the Sellon Collection in perfect condition. One, a rather worn specimen from the Chitty Collection, is labelled "Wales, 1888." Another specimen from the Norgate Collection, presented by Mr. B. H. Crabtree, is labelled "Wales."

Cucullia lychnitis.—Nine specimens with full data. Six from Berks, three from Surrey

C. asteris.—Six specimens with data from Surrey and Kent.

C. chamomillæ.—A long series with full data.

C. gnaphalii.—Two specimens without data from the Spilsbury Collection.

C. absinthia.—A long series from Devon and Portland.

Anarta cordigera.—Series of 16 with full data, all from Rannoch.

A. melanopa.—Nineteen with full data, also all from Rannoch.

Heliothis dipsacea.—Thirty-one with full data. Twenty from the New Forest taken by myself. Eight from the Champion Collection, "bred, Chobham, Surrey, 1913." Two from the Meldola Collection, "Maldon, Essex." In one of these last the dark markings of the underwings, instead of being black, are a pale reddish brown.

H. peltigera.—Ten with full data, 7 from Torquay, 1 from the Isle of Wight, 1 from Bridgwater, 1 from the Sellon Collection, labelled "Sydenham, 6 . 88."

H. armigera.—Three with data. One from the Spilsbury Collection, in fine condition, labelled "Babbicombe, J. Terry, Octr., 1871." One from the Meldola Collection, "Torcross, 29 . 8 . 01." The third from the Sellon Collection, "Kent, Strood, 1878."

Thalpochares parva.—One specimen from the Sellon Collection, labelled "Dover, Cummings Collection."

Erastria venustula.—Twenty-eight with full data. Twenty from the Meldola Collection, "St. Leonards Forest, Sussex." Eight from Brentwood, Essex.

Emmelia trabealis.—Long series from Spilsbury, Chitty and Sellon Collections, but unfortunately all without data. One specimen from the Meldola Collection, labelled "Tuddenham."

QUADRIFINÆ.

Plusia chryson.—Twelve with data. One from Swansea, bred and presented by Mr. W. Holland; the rest from Cambridge.

P. bractea.—Two with data, "Kincardineshire, 1916," presented by Mr. Horne. A fine series of 8 from the Hope and Spilsbury Collections without data.

P. ni.—One specimen from the Meldola Collection, bred in 1906 from ova deposited by a ♀ caught near Tenby by Mr. J. A. Finzi, recorded in 'Entom.,' 1906, p. 212.

P. interrogationis.—Twenty-three with data. Six labelled "Keswick, 1896," the rest from various Scotch localities.

Catocala fraxini.—Four specimens. One from the Hope Collection, much worn and damaged, labelled "Wells' British Collection." One from the Spilsbury Collection, labelled "Whitby." A second from the Spilsbury Collection in good condition is without data. One bred, 1910, by Dr. R. Whitehouse, who presented it to the Collection, from an ovum deposited by a female captured at Horsham, 16 . 7 . 09, by A. James, of Tootham.

C. nupta.—In the long series is one remarkable specimen from the Champion Collection. The usual red bands of the hind wing are of a very dark maroon-brown colour (ab. *brunnescens*, Warren). It was taken on a lamp in Guildford, September 2nd, 1907.

Toxocampa craccæ.—Twenty-eight with full data. Twenty-six of these are from N. Cornwall. Two, from the Meldola Collection, are labelled "N. Devon."

HYPENINÆ.

Laspeyria flexula.—Twenty-eight with full data from Dorset, Hants, Oxford, Surrey and Essex.

Parascotia fuliginaria.—Two from the Spilsbury Collection without data.

Zanclognatha emortualis.—One specimen from the Spilsbury Collection, labelled "Loughton, 1870."

Madopa salicalis.—Five specimens, all without data. One from the Hope Collection, two from the Spilsbury, two from the Sellon. The last two have not been reset, and are set very low on very old twist-headed pins.

Herminia cribrumalis.—Twenty-four specimens. Four from the Meldola Collection, labelled "Wicken Fen."

H. derivalis.—Ten specimens with data. Nine from Colchester, one from Abbots Wood.

Hypenodes tænialis and *costæstrigalis.*—A fair series of each species with full data. The same may be said of *Tholomiges turfosalis.*

ADLARD AND SON AND WEST NEWMAN, LTD., IMPR., LONDON AND DORKING.

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

BY F. C. WOODFORDE, B.A., F.E.S.

(Continued from p. 163.)

GEOMETRIDÆ.

THIS group has been arranged according to Mr. L. B. Prout's system worked out in Seitz's 'Macrolepidoptera of the World—Palæarctic Geometridæ.'

The group is well represented, there being very long series of most of the variable species, and no species is entirely unrepresented.

Before going further I should like, on behalf of the Hope Department, to tender thanks to those collectors who have so kindly added to the collection since these notes were first published, and especially to Mr. Greer, of Stewarts Town, who has presented a most interesting lot of Irish insects, and the Rev. C. Ash, of Saxton Vicarage, who has done the same with Yorkshire insects, so filling up several gaps in localities which were before unrepresented. Several others have also added contributions. Even the commonest species from unrepresented localities are most welcome.

ŒNOTHERINÆ.

Aplastis ononaria.—A single specimen without data from the Spilsbury Collection.

HEMITHEINÆ.

The sub-family is well represented.

Two remarkable male specimens of *Hipparchus* (*Geometra*) *papilionaria* bred by Prof. Poulton have a very blue tint, and stand out very conspicuously in the series. They were bred from larvæ reared by him for experimental purposes (see 'Tr. Ent. Soc.,' 1888, pp. 592–5, and 1892, pp. 310–11).

ACIDALIINÆ.

Acidalia immorata.—A long series with full data.

A. rubriginata.—Series of 26, 9 with data.

A. floslactata (remutata).—A remarkable specimen from the Meldola Collection, labelled "Forres, May 20, 1913," has a grey ground-colour with a fairly distinct grey central fascia.

A. nigropunctata (strigillaria).—Twenty in all, 5 with data, from the Pogson-Smith Collection, one labelled "Folkestone, 16.7.98," three others "Folkestone, 23.7.00," and the fifth, "Folkestone, 28.7.00."

Ptychopoda (Acidalia) ochrata.—Series of 19, 9 of them from the Meldola Collection, labelled "Deal."

P. serpentata (perochraria).—One specimen without data from the Spilsbury Collection.

Ptychopoda (Acidalia) eburnata (Contiguaria).—A series of 21 with data, mostly from Penmaenmawr.

P. straminata.—Series of 17 from the New Forest taken by myself; 6 from the Champion Collection from Woking; 5 *circellata* without data from the Spilsbury and Sellon Collections.

P. herbariata.—Two from the Spilsbury Collection without data.

P. holosericeata.—A long series with full data.

P. osseata (humiliata).—Series of 13 with full data.

P. degeneraria.—Series of 26 with full data.

Cosymbia (Ephyra) pendularia.—A long series of the type. A series of 80 from N. Staffs. ranging from pale almost typical specimens up to the darkest form of var. *subroseata*. Two bred from N. Staffs. var. *subochreata*, Wdde., one being the original type (see 'E.M.M.,' 1910, p. 114). One specimen (the type) of var. *orbiculoides*, Wdde. (see 'E.M.M.,' 1919, p. 103). One specimen var. *decoraria*, Newman (= var. *nigrosubroseata*, Bowman), from Oxshott.

C. orbicularia.—Series of over 30, mostly bred specimens from the New Forest.

C. annulata.—Three var. *obsoleta*, Riding; 2 var. *bi-obsoleta*, Riding, from the Meldola Collection.

LARENTIINÆ.

Rhodometra (Sterrha) sacraria.—Two specimens from the Spilsbury Collection without data.

Lithostege griseata.—Series of 24, 13 with data.

Oporinia (Oporabia) Christyi.—Three specimens from the Meldola Collection labelled "*O. Christyi*, Ireland, bred 1910."

Eustroma (Cidaria) reticulata.—Series of 16. Fourteen with full data. Six of the specimens were presented to the collection by the Rev. E. J. Nurse, and 2 by Mr. F. Littlewood. A larva, pupa, and a dried portion of the food-plant, *Impatiens noli-metangera*, were also presented by Mr. Nurse.

Plemyria (Melanthia) bicolorata.—A fine series of Scotch forms from the Meldola Collection includes many var. *plumbeolata* and intermediate forms.

Cidaria (Thera) variata.—A fine series of about 40, bred and taken wild by myself and the late Major Robertson in Hampshire, clearly shows the distinctness of this species from *obeliscata*. Of this latter species there is a very long series from many parts of Great Britain.

Cidaria truncata.—A very long series of English and Scotch forms. From the Hope Collection are three of Haworth's specimens of var. *comma-notata*. One of them, labelled with his characteristic MS., is probably his original type.

C. concinnata.—Seven specimens from the Meldola Collection are labelled "I. of Arran." Five more from the same collection are labelled "Tarbert, Aug 1914." These do not show so much rufous coloration as the Arran specimens.

C. immanata.—A long and beautiful series from England and Scotland. A Haworth specimen of var. *marmorata* from the Hope Collection, and so labelled in the characteristic MS., is probably his original type.

A specimen without data from the Spilsbury Collection of var. *thingvallata*.

Xanthorrhoe fluctuata.—A long series with many interesting aberrations. A specimen from the Meldola Collection is labelled "Dunbar, Aug. 12, 1912."

It is a most remarkable specimen, and at first sight it is difficult to believe that it belongs to this species, but on the whole the markings agree, and Mr. Prout has seen and confirmed it. The base of the fore wing is pale grey, bounded outwardly by a thickish black line corresponding to the outer part of the normal dark basal blotch. This is followed by a pale grey band intersected by three white streaks corresponding with or parallel to the veins. Beyond this rather narrow band comes the unusually broad central fascia of darker grey, rather wider than normal, and extending entirely across the wing, bordered on each side by a black line, which becomes less distinct towards the inner margin. Some of the veins in the fascia are white. The discal spot is distinct in the usual place. A distinct white line borders the outer black line, and both are much less indented than in a normal form. Touching the white line at the costa is a dark blotch extending to the apex of the wing, but partially broken by the whitish subterminal line. The outer part of the wing is grey except for the subterminal line. The fringes are spotted. The hind wings are pale grey, and have only two darker lines parallel to and near to the outer edges of the wings. The fringes are spotted. The general aspect of the specimen is much smoother and much less mottled than normal.

Xanthorrhoe (*Melanippe*) *montanata.*—A specimen of var. *costovata* without data from the Spilsbury Collection.

X. (*Coremia*) *quadrifasciaria.*—A fine series of 22 from the Oxford district, of which 18 were bred and presented by Mr. C. Rippon. There are also 6 Surrey specimens from the Champion Collection, and 2 from Essex from the Meldola Collection.

Cidaria obstipata (*fluviata*).—Series of 36. Fifteen ♂, 21 ♀. Twenty-six with full data; 10 bred, from Paignton; 16 bred, from Bournemouth.

C. sagittata.—Series of 25. Eleven with full data.

Euphyia (*Anticlea*) *cucullata.*—Series of 40. Twenty-eight with full data; of these, 6 are labelled "Perth, bred from pupa, W. H. Horwood." Sixteen were bred by myself from a wild female taken by me at Paignton, August 1st, 1919. The female parent is also in the series.

Euphyia (*Melanippe*) *unangulata.*—Series of 30, 19 with full data, mostly from Surrey and Hants.

E. picata.—Series of 25, 12 with data from Hants and Surrey.

E. (*Phibalapteryx*) *polygrammata.*—Series of 11. One labelled "Cambridge, 1878," from the collection of the late Major Robertson. Eight from the Spilsbury and 2 from the Chitty Collections, without data.

Epirrhoe (*Melanippe*) *sociata.*—A very long series One remarkable aberration taken by myself in June, 1920, on Cannock Chase is fully described, 'Entom.,' vol. liii, p. 286.

Perizoma (*Emmelesia*) *tæniata.*—Nine specimens. Two with data. One from the collection of the late Major Robertson is labelled "Lynton, July 31, 1901." The other was taken by myself at Paignton, August 1st, 1919 ('Entom.,' 1919, p. 21).

Perizoma (*Emmelesia*) *affinitata.*—A remarkable specimen from the Sellon Collection labelled "Salway Collection" has an ochreous ground-colour instead of the normal dark brown. One specimen of ab. *turbaria*, St., from the Meldola Collection from Kent, Darenth Wood.

Hydriomena furcata (*elutata*).—A long and varied series from many English and Scotch localities.

Eupithecia pini (*togata*).—Series of 38. Twenty-three with data, all Scotch.

E. irriguata.—The series of 26 includes 13 with full data, all from Hampshire.

E. insigniata.—A bred series of 10, labelled "Leominster, Mrs. Hutchinson." Four without data from the Spilsbury Collection.

E. palustraria (*pygmeata*).—Series of 11. Nine without data.

from the Spilsbury Collection, 2 labelled "Aberdeen, 1916," presented to the Collection by Mr. A. Horne.

E. venosata.—A long series, including 11 from Shetland with data.

E. trisignaria.—Series of 18, of which 4 from the Sellon Collection are labelled "Bred Burton, June, 1882."

E. helveticaria.—Twenty-one in series, including 12 from the Meldola Collection from Perth, with full data.

E. satyrata.—Series of 46. Thirty-six with data, including 12 var. *callunaria* and 8 var. *curzoni.*

E. tripunctaria (*albipunctata*).—Forty-three with full data and 8 without data, these last being from the Hope and Spilsbury Collections. In a series from Shropshire, bred by myself, is one specimen of var. *angelicata* entirely black, and another specimen very closely approaching, but with the white spot at the anal angle of the fore wing faintly indicated.

E. denotata (*campanulata*).—Series of 25 with full data from Worcester, Somerset and Sussex.

E. jasioneata.—Series of 19 with full data, 9 of them from Cornwall. The remaining 10 are interesting, being bred by Mr. B. G. Adams and myself from larvæ taken feeding on the flowers of Canterbury Bells in his garden in Mid-Devon far from the sea in 1915 and 1917.

E. distinctaria (*constrictata*).—A series of 21 with full data—17 from Cornwall, 2 from Gloucester, 1 from Portland, 1 from Sligo.

E. extensaria.—Series of 16 with full data.

E. fraxinata and *E. innotata.*—Series of 19, 10 with full data.

E. virgaureata.—Very poorly represented by a series of 6 from the Spilsbury Collection, without data. There were no specimens in any of the later collections.

E. debiliata.—A long series with full data from North Staffordshire, and 1 specimen from the Champion Collection from Surrey.

The genus *Eupithecia* is well represented on the whole, no species being without an example, and there are long series of most of the less rare species.

Cœnocalpe (*Phibalapteryx*) *lapidata.*—Series of 21 with full data. Four from Sutherland from the Pogson Smith Collection, and 17 from Lanark from the late Major Robertson's Collection.

23E

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

By F. C. Woodforde, B.A., F.E.S.

(Continued from vol. liv. p 289.)

Geometridæ, Geometrinæ.

(Arranged according to L. B. Prout's classification in Seitz's 'Palæarctic Macrolepidoptera.')

Abraxas grossulariata.—A very varied series of 135.

Most of the specimens are wild ones, with the variation tending to an increase of the black coloration, but two specimens from the Meldola Collection, taken in Wigtonshire, are almost quite white. Among the bred specimens are 3 var. *nigrosparsata*, 6 var. *lacticolor*, and 9 var. *varleyata*.

Angeroma prunaria.—A remarkable specimen of the ab. *corylaria* type from the Meldola Collection labelled "Essex. Chingford," has the usually dark base and outer margins of a pale ochreous colour with a reddish orange central band.

Gonodontis bidentata.—In the long series are 13 ab. *nigra*, Prout, from Yorkshire, and 14 from the Manchester district.

Ourapteryx sambucaria.—A specimen from the Chitty Collection, labelled "E. Woodhay, 1882," is almost pure white. A specimen of a second brood was presented by Mr. J. Collins, taken by him October 3rd, 1921.

Opisthograptis luteolata.—A specimen from the Meldola Collection, bred from a Perthshire larva, May 5th, 1912, has both hind wings and the lower half of the left fore wing pure white.

Venilia macularia.—A specimen from the Meldola Collection labelled "Kent, Dartford, June 25, 1872," is almost pure yellow, a few of the normal dark markings being very faintly shown by a pale ochreous colouring.

Macaria liturata.—The series includes 6 specimens of ab. *nigrofulvata*, Collins, 2 from North Staffs, and 4 from Delamere,

Phigalia pedaria.—The series includes many specimens of ab. *extinctaria* and ab. *monacharia*.

Nyssia zonaria.—A long series from Cheshire and Lancs, and 4 from Tiree.

Pœcilopsis lapponaria.—A long series of both ♂ and ♀.

Biston betularia.—The long series includes several forms intermediate between the type and ab. *doubledayaria*.

Boarmia repandata.—Series of over 200.

Ab. *conversaria*, ab. *nigricata* and ab. *sodorensium* are well represented. The restriction of the melanic forms to the North Midland and Northern English Counties is well illustrated.

Cleora arenaria (*viduaria*).—Series of 7 from the Spilsbury Collection, and 1 from the Sellon Collection.

Boarmia punctinalis (*consortaria*).—A long series of typical forms, and 12 melanic specimens bred from Sutton Coldfield stock, obtained from L. W. Newman.

Ectropis crepuscularia.—The long series contains many specimens of ab. *delamerensis*, from S. Wales, N. Staffs, Cheshire and Cumberland.

E. bistortata (*biundularia*).—Twenty melanic specimens from Swansea are included in the series.

E. consonaria.—The series includes 15 melanic specimens bred from larvæ of Rainham stock obtained from L. W. Newman.

Isturgia limbaria—A long series from the Spilsbury and Chitty Collections without data, 6 from the Meldola Collection labelled "Ipswich, 1895," and 2 from the Pogson Smith Collection labelled "Ross-shire, Achanalt, 6, 91."

Ematurga atomaria.—A long and very varied series. A most remarkable male specimen from the Chitty Collection and labelled "New Forest, 1887," is pure pale yellow without any markings at all.

Itame fulvaria (*brunneata*).—A long series from Perthshire and Aberdeenshire, and two specimens from North Staffs taken in June, 1920.

Chiasmia clathrata.—A remarkable specimen from the Pogson Smith Collection taken at Nettlebed, Oxon., in August, 1892, has the ground-colour of a uniform chocolate. Towards the outer margin of all four wings are a few small white spots.

ZYGÆNIDÆ.

Zygæna purpuralis.—A long series from N. Wales, Galway and Clare.

Z. achilleæ.—A series of 8 taken near Oban in 1919 by P. C. Reid, Esq., presented by him.

Z. trifolii.—A very long and varied series showing almost every form of variation, including var. *lutescens*, Cockl., from Emsworth, presented by W. M. Christy, Esq.

Z. filipendulæ.—Nine examples of ab. *flava*, Robson, bred by L. W. Newman from Kentish stock.

SESIIDÆ.

Sciapteron tabaniformis.—Three specimens. One from the Hope Collection labelled "Ealing Gardens, 1853." One from the Spilsbury Collection without date. The third from the Sellon Collection labelled "Cummings Collection."

Sesia scoliæformis.—A series of 14 from Rannoch, and a larva taken by myself in Canncock Chase, June 7th, 1920.

S. sphegiformis.—Four specimens bred Berkshire, presented by C. Rippon, Esq. Three from the Sellon Collection labelled "Tilgate Forest," and 10 from North Staffs taken at flowers, June, 1919, by myself.

S. andreniformis.—Series of 11 with full data, all from Kent. Three from the Meldola Collection, 8 presented by B. G. Adams, Esq.

HEPIALIDÆ.

Hepialus humuli.—Included in the series are over 70 specimens of var. *hethlandica.*

(To be continued.)

[*Reprinted from the 'Entomologist's Monthly Magazine,'* 3rd ser., vol. iv.]

TRYPETIDAE FROM THE OXFORD DISTRICT, WITH NOTES ON THEIR TIME OF APPEARANCE AND FOOD-PLANTS.

BY A. H. HAMM, F.E.S.

It is long since any special reference to the time of appearance and the food-plants of the *Trypetidae* has been published in the pages of this Magazine,* and I think that a few notes on the Oxford species may be of some assistance to those who take a delight in these interesting and beautiful flies. Some of the species are to be had in abundance by sweeping or searching at the right time their respective food-plants; or again, the galls, leaves, etc., containing the larvae, may be gathered and the occupants bred in due course. Then, too, the interest taken in collecting or breeding the commoner species will inspire the naturalist to search for some at least of the rarer and little-known forms, and thus in time we may hope that the habits and food-plants of all our native species may be known and recorded. It is with this object in view that I am induced to write the following rough notes.

Nearly all the following species were taken within three to four miles from the centre of Oxford, some at least within the boundary of the City itself.

Aciura rotundiventris Fln.—This rare species was taken as long ago as June 23rd, 1832, by the Rev. A. Matthews, at Weston-on-the-Green, near Oxford.† I have not met with it so far.

Acidia cognata W.—A few taken in various years, always at the end of June, resting on the upper-side of alder-leaves, Hogley Bog, near Cowley, Oxon, and several in a garden on Shotover Hill, on lilac-leaves, July 1, 1917.

A. heraclei L.—This is the well-known parsnip and celery fly, but away from gardens it is not at all plentiful. It can, however, usually be swept from *Heracleum.* My friend Mr. H. Britten bred it in large numbers during July 1916, from the blotched leaves of parsnips growing in his garden at Headington. Similar blotched leaves were present in almost every patch of parsnips looked at in gardens and allotments all over the district, but I believe it does little or no harm to this useful vegetable.

Gonyglossum wiedemanni Mg.—I have only met with this species on two occasions, both on Shotover Hill, probably swept from *Heracleum.*‡

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* R. C. Bradley, Ent. Mo. Mag. 1901, p. 9.

† C. W. Dale, Ent. Mo. Mag. 1904, p. 212.

‡ *G. wiedemanni* is to be found occasionally in numbers on *Bryonia dioica.*—J. E. C.

autumn, and if the galls are kept as recommended for *U. stylata* the flies can be bred the following year.

Sphenella marginata Fln.—Not an abundant species. I have taken a few by sweeping various thistles and ragwort, chiefly in the neighbourhood of Shotover Hill, during July and August.

Carphotricha guttularis Mg.—Not uncommon in a piece of rough pasture, on Shotover Hill, during July 1916. Both Mr. Britten and myself endeavoured to determine the plant from which they were swept, but neither of us could come to any certain conclusion. Perhaps the flies came from ragwort more frequently than any other plant.

Ensina sonchi L.—This very small, pale Trypetid was exceedingly abundant all over the district last autumn (September and October), and obtained by sweeping various *Compositae*, such as dandelions, hawkweeds, fleabane, etc. It was not, however, swept from *Sonchus* after many attempts, in spite of its name. This small fly bears a striking resemblance in colour to the grass-seeds of many kinds that are so plentiful at this time, and mixed up together as they all are in the sweeping-net, the insects are hard to distinguish; but in a short time, the flies begin to crawl up the sides of the net and can then be readily boxed or tubed.

Tephritis miliaria Schrk.—Not uncommonly taken by sweeping the creeping thistle (*Cnicus arvensis*). It occurred locally throughout the district from June to August.

T. (*Oxyna*) *proboscidea* Lw.—Taken by Mr. J. Collins, first at Wolvercote. June 15th, 1911, and again at Sunnymeade, July 8th, 1915, on both occasions by sweeping low herbage.

T. (*Oxyna*) *absinthii* F.—I have only taken this species once—near Brasenose Common, August 10th, 1915,—by sweeping a low bank with short herbage.

T. hyoscyami L.—Occurs both in spring and autumn. I have taken it plentifully by sweeping the spear thistle (*Cnicus lanceolatus*) in early June, and again in August, from the same patch of thistles. It also hibernates. Mr. Britten, after beating furze on Shotover Hill, March 4th, 1916, for *Coleoptera*, etc., gave me a sample of the various flies he had obtained, and among them was a specimen of this species. On April 1st we visited the same spot together, and by vigorous beating obtained a few more examples. Those who have never tried beating furze for Diptera during the winter months may be advised that many interesting species of hibernating flies can be obtained in this way.

T. vespertina Lw.—In my experience, undoubtedly the commonest species of Trypetid, to be found practically throughout the year, inasmuch as it hibernates like the preceding species. It was beaten from the furze-bushes in large numbers, at the same time and place as recorded for *T. hyoscyami*. *T. vespertina* may also occasionally be found on fences, etc., during warm days in mid-winter. In the summer it can be swept in abundance from *Compositae*.

T. bardanae Schrk.—Not a very common species in this district, but swept several times from the common burdock (*Arctium Lappa*), in June, at Hogley Bog and Headington Wick Copse.

Palloptera umbellatarum F.—Another fly, which has habits similar to those of a Trypetid, was constantly found in the sweeping-net in company with *U. stylata*. The females were often observed probing the flower-heads of the spear thistle with the extruded ovipositor. Whether the species breeds in the thistle-head or is parasitic on *U. stylata* I have not been able to ascertain.

My best thanks are due to Mr. J. E. Collin and Mr. C. G. Lamb for kindly naming or confirming the determination of doubtful species; also to my friend Mr. H. Britten, for his able assistance during our joint collecting excursions.

22 Southfield Road, Oxford.
March 1918.

FOURTH SUPPLEMENT

TO THE

PRELIMINARY LIST

OF

COLEOPTERA

IN THE

REPORT FOR 1906,

BY

JAMES J. WALKER,
HON. M.A., R.N., F.L.S.,
Secretary of the Entomological Society of London.

pp62-68.

FOURTH SUPPLEMENT

TO THE

PRELIMINARY LIST OF THE COLEOPTERA OF THE OXFORD DISTRICT,

Published in the Report of the Ashmolean Natural History Society of Oxfordshire for 1906.

By JAMES J. WALKER, Hon. M.A., R.N., F.L.S.

The three years that have elapsed since the publication of the Third Supplement to our Preliminary List of *Coleoptera*[1] have, as before, been marked by steady work at our local beetle-fauna by my energetic colleagues and myself; and each year has witnessed the addition of a fair number of rare and interesting species. We have to regret the loss of Mr. W. Holland, who left Oxford about two years ago, but his place in our little band of workers has been efficiently filled by his successor in the 'Hope Department,' Mr. H. Britten, F.E.S., to whose intimate acquaintance with the smaller forms of British beetles we are indebted for the records of many species in the more obscure families. Through his kindness I am for the first time able to include more than twenty species of the family *Trichopterygidæ*, the members of which are the smallest, and are certainly among the most difficult to determine, of our indigenous *Coleoptera*. The share of Mr. J. Collins in the discovery of species new to our local list is, as usual, a large one, and some valuable additions have been made by Mr. H. G. Champion and Mr. A. H. Hamm. As our district is more closely and systematically worked, new records are naturally fewer year by year, but the number of species (97) in the present Supplement brings the *Coleoptera* recorded since the time of the Rev. F. W. Hope within the 'seven-mile radius' up to the very satisfactory total of about 1,950 species.

On the whole, the past year may scarcely be regarded as having been a good one for *Coleoptera*. A fair number of interesting captures were made during the spring and early summer, but the autumnal collecting was completely ruined by the abnormal drought of September and October, which was followed by continuous and almost unprecedented wet weather to the end of the year, during which time outdoor work of any kind was almost impossible.

FAMILY **Carabidæ.**

Leistus rufescens, Fab. By sweeping on the 'Ruskin Plot' at Cothill, singly, 20th June and 13th September, 1913.

***Tachys bistriatus, Dufts.** On the bank of a pond in Wytham Park; one specimen, June, 1913 (*H. G. Champion*)

***Bembidium riparium, Ol.** Occurs sparingly on river banks with *B. biguttatum*, Sahlb. (*J.C.*).

FAMILY **Dytiscidæ.**

***Agabus uliginosus, L.** This very local species has been taken singly in flood-refuse at Sparsey Bridge, Water Eaton, by Mr. J. Collins, in January, 1913, and by myself on 2nd May, 1913.

FAMILY **Hydrophilidæ.**

***Henicocerus exsculptus, Germ.** One example taken in water-net, Gosford Bridges, 25th June, 1913.

***Ochthebius margipallens, Latr.** In flood-refuse, Sparsey Bridge, rare, 24th January, 1912.

FAMILY **Staphylinidæ.**

****Aleochara moesta, Grav.** Occurs sparingly throughout the district in company with A. *succicola*, Thoms. (*H.B.*).

****Ilyobates forticornis, Lac.** In flood-rubbish, Sparsey Bridge, very rare; taken singly by Mr. Collins in January, 1912, and by myself, 8th January, 1913, and 31st December, 1914.

***Homalota luteipes, Er.** Shotover Hill; one specimen in a nest of the ant *Lasius fuliginosus*, Latr., 22nd March, 1914 (*A.H.H.*).

H. malleus, Joy. Yarnton, 2nd November, 1908 (*J.C.*).

H. obtusangula, Joy. Marston, 1st July, and Wood Eaton, 10th July, 1908 (*J.C.*).

H. tomlini, Joy. Wytham, 20th April, 1905, and Yarnton, 4th August, 1908 (*J.C.*).

These species have been recently separated from *H. melanocera*, Thoms. (*volans*, Scriba) by Dr. N. H. Joy. *Cf.* Entom. Mo. Mag., 1913, pp. 57, 58.

****H. occulta, Er.** Cothill, singly, May 7th, 1910 (*J.C.*); Lye Hill, near Cowley, in carrion, 7th March, 1914 (*H.B.*).

***H. decipiens, Sharp.** Apparently widely distributed in damp places with *H. analis*, Grav.; Wood Eaton and Wytham Park (*J.C.*), Brasenose, Headington, Bullingdon Bog (*H.B.*). I have found it recently in flood-refuse from Sparsey Bridge.

****H. soror, Kr.** In flood-refuse, Duke's Cut, near Yarnton, 27th March, 1914 (*J.C.*).

H. reperta, Sharp. In fungus, Water Eaton, 24th June, 1910, and at Tubney, 9th October, 1911 (*J.C.*).

H. inoptata, Sharp. Generally common in fungi. This and the preceding species have been separated by Dr. Sharp from *H. fungicola*, Thoms.

H. sodalis, Er. Taken at Cothill, sparingly, 18th July, 1909 (*J.C.*).

** **H. autumnalis, Er.** In rotten oak boughs at Hen Wood; a series taken 17th August, 1908 (*J.C.*).

** **H. liliputana, Bris.** One example of this rare little species taken at Wytham Park in 1907 (*J.C.*)

* **H. germana, Sharp.** Taken at Besselsleigh, 6th September, 1908; also at Wood Eaton, Enslow Bridge and Wytham (*J.C.*).

* **H. sordidula, Er.** Wood Eaton, 11th April, 1908; Duke's Cut, Yarnton, 11th September, 1914 (*J.C.*).

* **H. canescens, Sharp.** Taken singly at Cothill, 10th April, 1909, and near Wytham, 6th August, 1910 (*J.C.*).

** **H. lævana, Rey.** One example at Tubney, 30th March, 1907 (*J.C.*).

H. muscorum, Bris. Wytham, one example, 14th May, 1910; King's Weir, in haystack, 9th April, 1910 (*J.C.*).

[**H. fungi, Grav.**, var. **dubia, Sharp.** This well-marked form, which merits specific rank, is widely distributed throughout the district.]

** **H. orphana, Er.** Taken singly at Cothill, 29th August, 1910, and at Tubney, 19th August, 1912 (*J.C.*).

** **Gyrophæna pulchella, Heer.** Cothill; sparingly in toadstools, 19th August, 1914.

[**G. convexicollis, Joy.**] Recorded in error from Yarnton as *G. lucidula*, Er. (First Supplement, Prel. List Coleop., Oxford, p. 58). It has been taken rather freely by evening sweeping at Prattle Wood by myself, also at Wytham Park by Mr. Collins.]

* **Hypocyptus discoideus, Er.** In flood-refuse, Sparsey Bridge, rare, January, 1912 (*J.C.*).

** **Mycetoporus angularis, Rey.** By sweeping under fir trees at Tubney, one specimen, 10th May, 1913.

** **Xantholinus cribripennis, Fauv.** One ♂ example of this rare northern species taken by Mr. J. Collins at Cothill, 3rd April, 1910; a ♀ found in a mole's nest at Bullingdon Bog by Mr. H. Britten, 17th October, 1914.

* **Stilicus fragilis, Grav.** One example under a birch faggot at Cothill, 28th September, 1913 (*J.C.*).

* **Stenus lustrator, Grav.** In flood-refuse, Sparsey Bridge, rare, January, 1912 (*J.C.*). This species is not uncommon in the peat-bog at Weston-on-the-Green.

* **S. ærosus, Er.** By evening sweeping at Wood Eaton; not rare, 8th May, 1912.

* **Bledius longulus, Er.** Found in plenty by Mr. H. Britten and Mr. A. H. Hamm, burrowing in sandy banks at Shotover brick-pit, in company with *B. opacus*, Block; October, 1914. Taken rarely at Tubney, June and July, 1910 (*J.C.*).

* **B. femoralis, Gyll.** One example at Shotover, 2nd May, 1914 (*H.B.*).

* **Platystethus nodifrons, Sahlb.** Taken rarely in flood-refuse at Duke's Cut, December, 1914 (*J.C.*).

** **Oxytelus fulvipes, Er.** In a tuft on the railway bank near Yarnton, one specimen, January 17th, and a second in flood-refuse at Duke's Cut, 25th March, 1914.

* **O. clypeonitens, Pand.** Taken not uncommonly flying in the University Museum grounds, 26th March, 1914 (*H.B.*).

* **O. fairmairei, Pand.** Single specimens taken near Wytham, 13th March and 25th May, 1910 (*J.C.*).

FAMILY **Clambidæ.**

** **Clambus punctulum, Beck.** Occurs sparingly with *C. armadillo,* De G., in flood-refuse, &c. (*H.B.*).

FAMILY **Silphidæ.**

*†**Choleva longula, Kelln.** By sweeping at Wytham Park; one specimen, 25th October, 1913.

*†**Colon denticulatum, Kraatz.** By sweeping at Tubney; one ♂ specimen, 31st August, 1912.

FAMILY **Clavigeridæ.**

*†**Claviger longicornis, Müll.** This very interesting addition to the British Coleopterous fauna was first taken at Gibraltar Quarries, Oxon, during the excursion of the Ashmolean Natural History Society on 31st May, 1906. Five examples were then found in nests of the black ant *Lasius niger*, L., under small stones. A few more were taken in the same spot in the spring of 1907, and in 1913 the insect again occurred there very rarely to Mr. Collins and myself. Mr. Britten also took a single specimen at Shotover, 18th April, 1914. (*Cf.* Entom. Mo. Mag., 1912, p. 100.)

FAMILY **Pselaphidæ.**

***Euplectus signatus, Reich.** This species, previously recorded in error from the District, was found not rarely in a haystack near Cumnor, 5th May, 1912 (*J.C.*).

FAMILY **Trichopterygidæ.**

Pteryx suturalis, Heer. In dead boughs; Tubney, 10th April, 1909, also at Cothill (*J.C.*).

***Ptinella denticollis, Fairm.** Under bark of an oak log, Water Eaton Grove, not rare, 15th October, 1911; also taken at Cothill by Mr. Collins, 27th April, 1914.

*†**Trichopteryx thoracica, Waltl.** Water Eaton, rare, 30th April, 1910 (*J.C.*).

T. atomaria, De G. In wet moss at Yarnton, August, 1908, also at Wytham (*J.C.*).

T. grandicollis, Mann. In vegetable refuse, &c.; generally common.

T. lata, Mots. With the preceding species; not rare.

T. fascicularis, Hbst. In haystack refuse, Yarnton and Tubney, not rare (*J.C.*).

***T. sericans, Heer.** Taken flying in High Street, Oxford, 1914 (*A.H.H.*).

***T. brevipennis, Er.** In rotten wood at Water Eaton, singly, 6th March, 1910 (*J.C.*).

***T. montandoni, All.** In hollow elm at Water Eaton, 1st August, 1908 (*J.C.*); found by me in plenty in elm stump near Tubney, April, 1910.

Ptilium kunzei, Heer. In vegetable refuse at Headington, July, 1914 (*H.B.*).

*†**P. rugulosum, All.** In rotten wood, Wytham Park, 6th August, 1910, and at Tubney, 12th April, 1914, rare (*J.C.*)

***P. exaratum, All.** Cumnor, May 5th, 1912 (*J.C.*); Headington and Brasenose (*H.B.*).

P. foveolatum, All. In haystack refuse at Lye Hill, 7th March, 1914 (*H.B.*).

***Nossidium pilosellum, Marsh.** In rotten wood, occasionally by sweeping; has occurred at Wytham Park on several occasions to Mr. Collins and myself.

***Ptenidium fuscicorne, Er.** Wood Eaton, rare, in wet place, 17th April, 1908 (*J.C.*).

P. nitidum, Heer. In manure-heaps, vegetable refuse, &c.: generally common.

P. lævigatum, Gyll. Taken by Mr. Collins at Yarnton, February, 1909

****P. gressneri, Er.** In hollow stump of elm near Tubney, in company with *Trichopteryx montandoni*, All., and *Ptenidium nitidum*, Heer; not rare, 15th April, 1910.

FAMILY Corylophidæ.

***Orthoperus mundus, Matt.** In hard fungus on birch, several at Wytham Park, 15th August, 1908 (*J.C.*).

***O. coriaceus, Rey.** Beaten out of spruce-firs, Tubney, 5th June, 1910; also in moss on oak trunks at Pratle Wood and by sweeping at Wytham (*J.C.*).

FAMILY Coccinellidæ.

***Hyperaspis reppensis, Hbst.** Tubney; one specimen in sand-pit, May 28th, 1914.

***Scymnus redtenbacheri, Muls.** This species has occurred rarely to me by sweeping at Cothill and Tubney.

FAMILY Histeridæ.

***Hister neglectus, Germ.** One specimen in flood-refuse, Sparsey Bridge, January, 1912 (*J.C.*).

FAMILY Nitidulidæ.

****Epuræa diffusa, Bris.** By sweeping near Cothill; one specimen, 6th August, 1913 (*J.C.*).

***E. parvula, Sturm.** In birch faggots at Cothill, rather commonly, 20th September, 1913.

****E. angustula, Er.** One example of this rare and usually northern species taken by sweeping under beech trees at Wytham Park, 30th July, 1913.

***Nemosoma elongatum, L.** This very interesting beetle has been taken rather freely in all its stages under bark of elm rails at Water Eaton, in company with *Hylesinus vittatus*, F., on which it is parasitic. First found by Mr. J. Collins, 3rd August, 1913.

***Cryptophagus badius, Sturm.** In a cellar at Headington, rare, 21st February, 1914 (*H.B.*).

****C. validus, Kraatz.** By sweeping near Enslow Bridge, 3rd August, 1913 (*J.C.*).

***C. pallidus, Sturm.** In haystack refuse, Water Eaton, rare, 20th February, 1910 (*J.C.*).

****Micrambe abietis, Payk.** By sweeping at Wytham Park; one specimen, 16th October, 1913.

***Atomaria fumata, Er.** In tufts of grass at Wolvercote Paper Mill; rare, 31st March, 1913.

[**Heterocerus marginatus, F.** This species, formerly recorded in error, has been found not uncommonly in wet muddy places at Shotover, Godstow, &c. (*J.C.*).]

FAMILY Scarabæidæ.

***Copris lunaris, L.** One dead but perfect ♀ specimen of this conspicuous beetle picked up by the roadside at Tubney, 17th May, 1913.

FAMILY Telephoridæ.

***Rhagonycha unicolor, Curt.** A pair taken by sweeping at Wytham Park, 8th June, 1911 (*J.C.*).

FAMILY **Cerambycidæ.**

Criocephalus ferus, Muls. One ♀ specimen taken by Mr. T. Trollope in his house at Summertown, 21st August, 1914 (*J.C.*). (*Cf.* Ent. Mo. Mag., 1914, p. 246.)

*Molorchus minor, L.** Taken singly by sweeping flowers at Cothill, 18th May, and at Bladon Heath, 7th June, 1913 (*J.C.*).

FAMILY **Chrysomelidæ.**

*Donacia clavipes, F.** On rushes at King's Weir, singly, 14th June, 1914 (*J.C.*).

*Phyllobrotica quadrimaculata, L.** One example on alder, Bullingdon Bog, 23rd June, 1912 (*A.H.H.*).

*Longitarsus anchusæ, Payk.** On *Echium vulgare,* Hitch Copse, near Cothill; rare, 28th June, 1913.

*L. curtus, All.** Wytham Park; taken sparingly by sweeping [*Echium*], &c., autumn, 1912 (*J.C.*); and by myself in October, 1913.

*L. ballotæ, Marsh.** On *Ballota nigra* at entrance of Kennington Lane; locally common, 19th September, 1914.

*Phyllotreta diademata, Foudr.** This species (first identified by Mr. H. Britten) appears to be widely but sparingly distributed throughout the district on various Cruciferous plants.

Psylliodes luteola, Müll. First taken by Mr. J. Collins sparingly near Enslow Bridge by sweeping grass, &c., August, 1912. It has since been found more freely by the roadside under the north wall of Kirtlington Park, as well as in the Park itself, in September and October by myself.

Cassida hemisphærica, Hbst. One specimen in Tubney sand-pit, May 24th, 1913 (*H. G. Champion*); a pair taken by myself by sweeping, Tubney, 27th September, 1913.

FAMILY **Rhipidophoridæ.**

*Metœcus paradoxus, L.** This curious and interesting beetle was found in a nest of *Vespa vulgaris,* L., at Tubney by Mr. Hassan, of Lincoln College, August, 1913 (*A.H.H.*); also near Summertown by Mr W. Hainge, 4th September, 1913 (*J.C*).

FAMILY **Xylophilidæ.**

*Xylophilus oculatus, Gyll.** One specimen by sweeping under beech trees at Wytham Park, 30th July, 1913.

FAMILY **Curculionidæ.**

Apion immune, Kirby. On broom at Boar's Hill, rare, 19th April, 1912.

Gymnetron collinus, Gyll. Found sparingly on *Linaria vulgaris* near Tubney, in company with *G. linariæ,* Panz., in plenty; first taken 15th September, 1912 (*J.C.*).

*Balaninus rubidus, Gyll.** On small birch trees; Tubney, 14th September, 1913, and Cothill, 13th August, 1914, rare (*J.C.*).

FAMILY **Scolytidæ.**

Scolytus rugulosus, Ratz. This species, previously recorded in error, was taken by Mr. Collins by sweeping at Tubney, 16th August, 1913.

*Xyleborus saxeseni, Ratz.** Found sparingly with *Trypodendron domesticum,* L., in dead beech boughs in lane from Wytham to the Park, June, 1913 (*J.C.*).

31st December, 1914.

FIFTH SUPPLEMENT

TO THE

PRELIMINARY LIST

OF

COLEOPTERA

IN THE

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BY

JAMES J. WALKER,

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FIFTH SUPPLEMENT

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PRELIMINARY LIST OF THE COLEOPTERA OF THE OXFORD DISTRICT,

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History Society of Oxfordshire for 1906.

By JAMES J. WALKER, Hon. M.A., R.N., F.L.S.

The investigation of the Coleopterous fauna of our District has been continued without interruption, despite the many troubles of the last six eventful years, and the additions herewith presented to our extensive local list of beetles include a considerable number of rare and interesting species, the names of which appear in our Reports from 1915 onwards. Advantage has been taken of the present opportunity to include several notable species which have been found in past years at Weston-on-the-Green and other localities just beyond the conventional 'seven-mile radius' from Carfax; and some of these without doubt will be found within its limits in course of time. Other additions have resulted from the revision by well-known Coleopterists in recent years of certain of the more obscure and difficult genera of beetles; and the very important paper on the British *Stylopidae* by Dr. R. C. L. Perkins, F.R.S., in the 'Entomologist's Monthly Magazine' of April, 1918 (Vol. LIV, pp. 67-78), has enabled our colleague, Mr. A. H. Hamm, who has made a special study of these wonderful parasites of the *Hymenoptera,* to add very largely to the number of species which occur in the District. Another very important contribution to biological science in connection with these insects has been made by the late Mr. Geoffrey Smith, of New College, and Mr. Hamm, chiefly based on material obtained at

Oxford.* On the other hand, several species, mostly included in the 'Preliminary List' of 1906 in error, or on what now appears to be insufficient evidence, must be withdrawn. These are as follows:—

Harpalus (*Ophonus*) *puncticollis*, Payk., *H. parallelus*, Dej., *Anchomenus sexpunctatus*, L., *A. versutus*, Gyll. (there is no suitable locality in the district for these eminently heath- and *Sphagnum*-frequenting species), *Myllaena kraatzi*, Sharp, *Thinobius linearis*, Kr., *Coccidula scutellata*, Herbst., *Lamprosoma concolor*, Sturm, *Gymnetron villosulus*, Gyll., *Halictophagus curtisii*, Dale.

The revision of the difficult species of the genus *Haltica* by Dr. D. Sharp (Ent. Mo. Mag., 1914, pp. 259-264), involves the following corrections to the 'Preliminary List':—

Haltica ericeti, All. Occurs very rarely on heather at Tubney.

H. ytenensis, Sharp (*oleracea*, Brit. Coll., *nec* L.). This is the commonest species of the genus throughout the District, and is found almost everywhere on a great variety of plants (*Epilobium, Helianthemum, Calluna*, &c.).

H. pusilla, Dufts. On limestone soils, by sweeping *Helianthemum*, &c.; Bayswater Mill, Wytham Park, sparingly; also at Wychwood Forest.

By the removal of Mr. H. Britten from Oxford we have lost one of our most successful workers, especially in the minute and more difficult groups of beetles, but, as before, a large number of the most important and interesting additions to the local list of *Coleoptera* are due to the undimished energy of Mr. J. Collins.

The 130 species included in the present 'Supplement' bring the total number of *Coleoptera* recorded from the Oxford District (allowance being made for withdrawals) to the very satisfactory figure of 2,070 species. Ample material now exists for a comprehensive annotated list of the Oxford beetles, on the model of the 'Entomologia Edinensis,' a useful little volume well known to working Coleopterists; but the prohibitive cost of such a work at the present time necessitates the indefinite postponement of this undertaking.

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* Smith, Geoffrey, M.A., and Hamm, A. H., 'Studies in the Experimental Analysis of Sex. Part II—On Stylops and Stylopisation,' *Quart. Journ. Micr. Science*, Vol. 60, pp. 435-461, plates 32-35.

Family **Carabidæ.**

Ophonus (Harpalus) brevicollis, Dej.
O. rectangulus, Thoms.
These two species, recorded under the name of *H. puncticollis*, Payk., are locally common throughout the district. *Cf.* D. Sharp, Entom. Mo. Mag., 1912, pp. 183, 229.

***Tachypus pallipes, Dufts.** Cumnor, in sand-pit, one example, July, 1916 (*J.C.*).

***Lebia chlorocephala, Hoffm., var. chrysocephala, Mots.** This well-marked variety has occurred on two or three occasions in tufts of grass in Bagley Wood; first taken March 13th, 1915.

***Dromius quadrisignatus, Dej.** Tubney Wood, under oak bark, one example, June 12th, 1915. (Recorded from "Weston, Oxfordshire, under bark of firs," probably by the Rev. A. Matthews.)

Family **Haliplidæ.**

***Haliplus fulvus, F.** Yarnton, one example (*J.C.*)

H. heydeni, Wehncke
H. wehnckei, Gerk.
These two species have been recently separated from *H. ruficollis*, De G. and have been identified by Mr. H. Britten. Apparently not rare.

Family **Dytiscidæ.**

***Hydroporus melanarius, Sturm.** Boar's Hill, one example, May, 1918 (*J.C.*).

***H. ferrugineus, Steph.** In small dried-up pond near Stanton St. John; one, July 3rd, 1918.

*[**Agabus biguttatus, Ol.** A good many examples taken by Mr. J. Collins in the mill-stream at Weston-on-the-Green, April, 1907.]

Family **Gyrinidæ.**

***Gyrinus urinator, Ill.** In the mill-stream, Gosford Bridges, a pair, September 6th, 1918.

Family **Hydrophilidæ.**

Enochrus bicolor, Payk. Has occurred rarely in flood-refuse at Sparsey Bridge, &c., to Mr. Collins and myself.

****Helophorus granularis, L.**
H. walkeri, Sharp.
These two species have been taken in stagnant water at Shotover Hill by Mr. H. Britten.

Sphæridium quadrimaculatum, Marsh. Recently recognised as distinct from *S. scarabæoides*, L.; first taken in 1906 (*J.C.*).

Cercyon marinus, Thoms. In small pond on Shotover Hill, rare, August, 1917 (*H.B.*).

***Cerycon sternalis, Sharp.** Yarnton, in wet moss, 1908 (*J.C.*); not rare in flood refuse, Duke's Cut, &c.

***C. minutus, F.** Occurs sparingly with the preceding species.

Family **Staphylinidæ.**

***Ocyusa picina, Aubé.** Wytham Park, in wet moss, rare, April 24th, 1920. It is common in moss, grass-tufts, &c., at Weston-on-the-Green.

***Oxypoda pectita, Sharp.** Marston Ferry Lane, in manure-heap, one, March 24th, 1917.

***Ocalea castanea Er.** Wytham Park, in dead leaves, rare, February 18th, 1920.

***Homalota hygrotopora Kr.** In moss, Bayswater Brook, rare, June 17th, 1917 (*H.B.*).

****H. crassicornis, Gyll.** Wood Eaton, December 7th, 1919 (*J.C.*); also at Wolvercote Paper Mill.

***H. exillima, Sharp.** Mesopotamia, spring, 1915 (*H.B.*). Often plentiful in flood-refuse.

****H. exarata, Sharp.** This rare species has been obtained by sweeping on two or three occasions at Boar's Hill, and once on Shotover Hill. First taken May 22nd, 1917.

***Tachyusa constricta, Er.**
***T. flavitarsis, Sahlb.**
These two species were taken by the late Mr. A. J. Chitty in a wet place on Shotover Hill, May, 1907.

Gyrophæna gentilis, Er. Tubney, October 16th, 1915, rare (*J.C.*).

***G. bihamata, Thoms.** Wytham Park, 1919 (*J.C.*); Magdalen College grounds, in fungi (*H.B.*).

***G. lucidula, Er.** Wytham Park, in wet moss, one specimen, March 20th, 1920.

***Placusa infima, Er.** Wytham Park, under sappy bark of beech, sparingly, October, 1919.

****Oligota parva, Kr.** Headington, in refuse, Spring, 1915 (*H.B.*).

Myllæna dubia, Grav. Yarnton, in moss, August 2nd, 1908; Tubney, 1917 (*J.C.*).

M. intermedia, Er.
***M. elongata, Matth.**
M. gracilis, Matth.
These species have been taken in Shotover Brick-pit by Mr. H. Britten, Spring, 1915.

Tachyporus tersus, Er. Shotover Hill, not uncommon in moss, &c. (*H.B.*).

***Tachinus collaris, Grav.** Sparsey Bridge, in flood-refuse, rare, March, 1916.

***Mycetoporus nanus, Er.** In moss on bank of a pond, Tubney, one example, March 25th, 1916.

****Ocypus cyaneus, Payk.** This fine and rare beetle was first taken in a small sand-hole between Besselsleigh and Tubney, July 23rd, 1916 (Ent. Mo. Mag., 1916, p. 205); and it has occurred very sparingly in the same district in the three following years (*J.C.*).

***Actobius villosulus, Steph.** Marston Ferry, in flood-refuse, one specimen, May 17th, 1918.

***Stenus fuscicornis, Er.** Wytham Park, by sweeping, one specimen, September, 1918.

***Trogophlœus tenellus, Er.** Duke's Cut, in flood-refuse, rare, December, 1915.

****T. subtilis, Er.** The insect recorded in Supplement III (1911), under the name of *Thinobius linearis*, Kraatz, is to be referred to this very rare species.

****Homalium gracilicorne, Fairm.** Wytham Park, by sweeping, one specimen, Autumn, 1915.

****Proteinus crenulatus, Pand.** Shotover, in fungus, very rare, August, 1915 (*H.B.*).

Megarthrus affinis, Müll. Marston Ferry Lane, by sweeping, May, 1915.

***Phlœocharis subtilissima, Mann.** Shotover, in fungus, very rare, August, 1915 (*H.B.*).

FAMILY **Silphidæ.**

****Anisotoma lunicollis Rye.** A male example of this rare species taken by sweeping at Tubney, August 27th, 1917 (*J.C.*).

***Choleva glauca, Britt.**
***C. sturmi, Bris.** These two species, separated by Mr. H. Britten from *C. angustata*, F. (Ent. Mo. Mag., 1918, pp. 30-33), occur sparingly in moles' nests, vegetable refuse, &c.

***C. morio, F.** In flood-refuse, moles' nests, &c.; widely distributed and not rare (*J.C.*).

FAMILY **Scydmaenidæ.**

****Euconnus mäklini, Mann.** A male example of this exceedingly rare insect taken by evening sweeping near Bayswater Mill, July 19th, 1916.

****Euthia formicetorum, Kr.** In decayed oak boughs, Prattle Wood; two examples, April 14th, 1915.

FAMILY **Pselaphidæ.**

****Bythinus distinctus, Reich.** By evening sweeping near Marston Ferry, one, August 6th, 1917.

****Euplectus aubeanus, Reitt.** By sweeping under hedges near Marston Ferry, rare, early summer; first taken May 8th, 1918.

FAMILY **Trichopterygidæ.**

[****Ptinella britannica, Matth.** Weston-on-the-Green, on back of slug (*Rev. A Matthews*).]

***P. aptera, Guér.** Under bark near Bayswater Mill, scarce, May 13th, 1916 (*H.B.*).

****Trichopteryx fratercula Matth.** In flood-refuse, Sparsey Bridge, rare, 1916 and 1918 (*J.C.*).

[****T. poweri, Matth.** Weston-on-the-Green, in moss (*Rev. A. Matthews*).]

****Smicrus filicornis, Fairm.** Wolvercote Paper Mill, by sweeping, one, September 9th, 1919.

***Nephanes titan, Newm.** Headington, in refuse, Spring, 1915 (*H.B.*); Summertown, common in manure-heaps.

[****Ptilium brevicolle, Matth.** Weston-on-the-Green, unique (*Rev. A. Matthews*).]

***P. spencei, All.** In débris of wasp-nest, Wytham Park; plentiful, October 12th and 14th, 1920.

***Millidium trisulcatum, Aubé.** In manure-heap, Summertown; not rare, May, 1918.

***Ptenidium punctatum, Gyll.** In manure-heap, Marston Ferry Lane, rare, March 17th, 1917.

***P. brisouti, Matth.** Headington, in refuse (*H.B.*).

****P. (Wankowiezium) intermedium, Wank.** In a mole's nest, Yarnton, four examples, March 14th, 1915 (*J.C.*).

FAMILY **Corylophidæ.**

***Orthoperus kluki, Wank.** Wytham Park, scarce (*J.C.*).

***O. corticalis, Redt.** Rather widely distributed; Godstow, Kirtlington, Besselsleigh, &c. (*J.C.*).

***O. punctatulus, Matth.** Headington (*H.B.*).

***Corylophus sublævipennis, Duv.** Enslow Bridge, 1910; King's Weir, in flood-refuse, February, 1920 (*J.C.*).

[FAMILY **Sphaeriidæ.**]

[**__Sphærius acaroides, Waltl.__ First taken in Britain at Weston-on-the-Green in 1845 (*Rev. A. Matthews*). I have not myself met with it.]

FAMILY **Coccinellidæ.**

**__Scymnus arcuatus, Rossi.__ Beaten very sparingly from old ivy on the walls of Godstow Nunnery; first taken July 30th, 1915.

FAMILY **Erotylidæ.**

Triplax russica, L. In *Polyporus* on elm, Hitch Copse, Cothill; one example, July 13th, 1918.

FAMILY **Colydiidæ.**

**__Synchita juglandis, F.__ A single living example of this rare species was found in a spider's web on a dead birch tree in Tubney Wood, June 12th, 1915.

*__Cerylon fagi, Bris.__ In old beech stump, singly, Wytham Park, February 18th, 1920.

*__C. ferrugineum, Steph.__ Tubney Wood, under bark of dead birch, one, June 19th, 1915.

FAMILY **Histeridæ.**

*__Paromalus flavicornis, Herbst.__ Tubney, under oak bark, one, October 10th, 1915 (*J.C.*); Wytham Park, under ash bark, one, February 9th, 1918.

FAMILY **Nitidulidæ.**

Carpophilus mutilatus, Er. I have recently found this species on several occasions in dates, in company with *C. hemipterus*, L., and *Silvanus mercator*, Fauvel.

Meligethes memnonius, Er. In *Lamium* and other Labiate flowers; not rare, and generally distributed.

*__M. viduatus, Sturm.__ In small Composite flowers in summer; Tubney, not rare.

M. flavipes, Sturm. Wood Eaton, June, 1907 (*J.C.*); not rare in Labiate flowers.

*__M. rotundicollis, Bris.__ By sweeping in early summer; Tubney, Wytham Park, &c, scarce.

FAMILY **Monotomidæ.**

Monotoma brevicollis, Aubé. In dry dung near Headington, several, August 24th, 1914. Not uncommon in manure-heaps.

FAMILY **Lathridiidæ.**

**__Coninomus constrictus, Gyll.__ In débris of nest of the ant *Acanthomyops* (*Lasius*) *fuliginosa*, Latr., near Tubney; rare, July 31st, 1920.

**__Cartodere filum, Aubé.__ Found sparingly in the herbarium of the School of Rural Economy in 1918 (*Mr. Williamson*).

*__Corticaria fenestralis, L.__ Oxford University Museum, in a window; one specimen, July 23rd, 1919.

FAMILY **Cryptophagidæ.**

Cryptophagus hirtulus, Kr. Headington (*H.B.*) Apparently widely distributed.

*†**C. fumatus Gyll.** This rare species was first taken by Mr. H. G. Champion at Weston-on-the-Green, September 16th, 1912. It was found in the University Museum, June 14th, 1915, and on a few subsequent occasions by Mr. Collins and myself; and I have taken single specimens with *Acanthomyops fuliginosa*, Latr., near Tubney, July 26th, 1919, and August 13th, 1920.

††**Atomaria wollastoni, Sharp.** By sweeping under hedges near Marston Ferry; one example, May 12th, 1919.

†***A. zetterstedti, Zett.** This interesting addition to the British Coleopterous fauna was first taken by Mr. J. Collins in April, 1914, by beating old sallow-blossoms at Weston-on-the-Green; and subsequently, May, 1918, at Yarnton, when I have taken it freely in his company. *Cf.* Entom. Mo. Mag., 1918, pp. 155-6.

FAMILY **Scarabaeidæ.**

[***Aphodius lividus, Ol.** One specimen taken on the wing, Kirtlington Belt, September 16th, 1912.]

FAMILY **Elateridæ.**

***Corymbites cupreus, F.** A female example picked up in Broad Street, Oxford, June 8th, 1915. Also taken on Shotover Hill by Mr. Britten.

FAMILY **Telephoridæ.**

[***Silis ruficollis, F.** Occurs sparingly on reeds at Weston-on-the-Green in July.]

FAMILY **Sphindidæ.**

***Sphindus dubius, Gyll.** Wytham Park, in snuff-like fungus on rotten beech logs, July 5th, 1915, subsequently found in plenty.

FAMILY **Cissidæ.**

***Ennearthron affine, Gyll.** In hard white fungus on beech stumps, Wytham Park, not rare; first found July 5th, 1915.

FAMILY **Prionidæ.**

***Prionus coriarius, L.** Remains of this conspicuous beetle were found at the foot of a dead birch-tree in Tubney Wood, November 20th, 1915; and two living examples, both males, were taken there, August 20th, 1917, and July 31st, 1919.

FAMILY **Bruchidæ.**

Bruchus villosus, F. On flowers of broom at Foxcombe Hill; not rare, May 16th, 1918.

FAMILY **Chrysomelidæ.**

***Donacia cinerea, Herbst.** King's Weir, on *Glyceria aquatica*; one specimen, June 15th, 1915.

***Luperus nigrofasciatus, Goeze.** Open Brazenose, on furze; one specimen, September 23rd, 1916 (*H.B*).

****Longitarsus suturalis, Mars.** Wytham Park, one example, October 6th, 1912 (*J.C.*).

[****Apteropeda globosa, Ill.** By sweeping in Abel Wood, near Hanborough Station; one specimen, May 14th, 1920.]

FAMILY **Tenebrionidæ.**

***Alphitobius diaperinus, Panz.** In damaged maize, Cothill Mill, rare, November 20th, 1915; found in abundance at the bone-works, Eynsham Mill, August 6th, 1920.

***Palorus ratzeburgi, Wiss.** Cothill Mill, with the preceding species; abundant, November 20th, 1915.

FAMILY **Melandryidæ.**

***Hallomenus humeralis, Panz.** By evening sweeping near Water Eaton; one specimen, June 18th, 1915.

FAMILY **Mordellidæ.**

***Mordellistena parvula Gyll.,** var. **inæqualis, Mus.** On *Artemisia vulgaris*; Tubney, one specimen, Summer, 1918 (*J.C.*).

***Anaspis rufilabris, Gyll.** In rotten oak wood; Wytham Park, several, September, 1919 (*J.C.*).

FAMILY **Curculionidæ.**

***Rhynchites pauxillus, Germ.** Hell Coppice, near Stanton St. John; one example, May 22nd, 1920.

***Apion desideratum, Sharp.** Most of the specimens recorded as *A. cruentatum,* Walt., are to be referred to this species. The true *A. cruentatum* occurs rarely at Tubney, where *A. hæmatodes,* Kirby, var. *brachypterum,* Sharp, is also found.

***A. waltoni, Steph.** Near Bayswater Mill, locally common on *Anthyllis, Helianthemum,* &c.; first taken August 24th, 1914.

****Otiorrhynchus porcatus, F.** A specimen of this recent introduction to the British list of *Coleoptera* was taken at Summertown by Mr. H. E. Gray, June 28th, 1918 (J. Collins, Ent. Mo. Mag., 1918, p. 209).

[***Tropiphorus carinatus, Müll.** Abel Wood, near Hanborough Station; two examples by sweeping, May 14th, 1920.]

***Orchestes pratensis, Germ.** By sweeping at Hell Coppice, not rare; first taken July 3rd, 1918.

***Pseudostyphlus pilumnus, Gyll.** Under *Matricaria inodora,* Sunnymead allotments, 1918, rare, July, 1915 (*J.C.*).

***Dorytomus validirostris, Gyll.** Shotover Hill, by sweeping; one specimen, May 4th, 1918.

[****Acalyptus carpini F.,** var. **rufipennis, Gyll.** This rare and interesting little weevil was first found singly in vegetable refuse at the Peat-pits, Weston-on-the-Green, March 17th, 1913; and sparingly on April 17th, by beating sallows in bloom. It has been obtained in large numbers by the same method in succeeding years, and has also been taken freely by sweeping, July 18th, 1914]

[***Miarus graminis, Gyll.** In flowers of *Campanula glomerata* at Stocky Bottom, near Stonesfield; plentiful, August 15th, 1915.]

****Centhorrhynchus rapæ, Gyll.** This fine and rare species was taken by Mr. J. Collins on *Sisymbrium officinale* at Godstow, August, 1918; and has occurred there very sparingly in the same month in succeeding years.

***C. triangulum, Boh.** On *Achillea Millefolium* at Foxcombe Hill, rare, May 18th, 1916; Shotover Hill, not uncommon on the same plant.

***Ceuthorrhynchidius rufulus, Duf.** By sweeping at Godstow, August 23rd, 1919, and at Tubney, September 25th, 1920; single examples in both cases.

***Phytobius canaliculatus, Fahr.** Taken rarely by Mr. A. J. Chitty at Shotover Hill, May, 1907.

FAMILY Scolytidæ.

***Cryphalus binodulus, Ratz.** Cothill, by beating *Populus cinerea*; rare, July 20th, 1916.

[****C. abietis, Ratz.** Kirtlington Belt, by sweeping under spruce firs; four examples, May 3rd, 1909.]

Abnormal Coleoptera.

Stylops melittæ, Kirby. Host, **Andrena nigroænea, Kirby.** Male and female sometimes abundant in University Parks; also at Boar's Hill and Shotover.

S. wilkellæ, Perkins. Host, **Andrena wilkella, Kirby.** Generally abundant in the University Parks and Museum grounds (*A.H.H.*).

S. hammella, Perkins. Host, **Andrena chrysosceles, Kirby.** Shotover Hill, Boar's Hill, Sandford (*A.H.H.*).

S. spencii, Pickering. Host, **Andrèna tibialis, Kirby.** Shotover Hill (*A.H.H.*).

S. aterrima, Newport. Host, **Andrena trimmerana, Kirby.** Boar's Hill, not uncommon.

S dalii, Curtis. Host, **Andrena labialis, Kirby. Boar's Hill, rare,** (*A.H.H.*).

S. spretæ, Perkins. Hosts, **Andrena spreta, Pérez,** and (?) **A. minutula, Kirby.** Oxford, Shotover Hill (?) (*A.H.H.*).

Halictoxenus spencii, Nassanov. Host, **Halictus nitidiusculus, Kirby.** University Parks, June 16th, 1902 (*A.H.H.*).

31st December, 1920.

HOLYWELL PRESS, ALFRED STREET.

From the ANNALS AND MAGAZINE OF NATURAL HISTORY
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Brief Descriptions of new Thysanoptera.—I. By RICHARD S. BAGNALL, F.L.S., F.E.S. (Hope Department of Zoology, University Museum, Oxford).

IN this series of papers I propose to shortly describe new Thysanoptera, or thrips, from various parts of the world, though the collections in my hands at present are chiefly from Africa and India. This material, for which my hearty thanks is due, has been received from many sources, which I will more particularly mention in several larger contributions now in preparation.

I am especially anxious to have material from Australia, Japan, Asia (particularly from the north and west), Central and South Africa, South America, and the Polynesian and other groups of islands.

Suborder TEREBRANTIA.

Family **Thripidæ**.

Retithrips bicolor, sp. n. (Vine thrips).

♀.—Length about 1·6 mm.

Rich golden-yellow, tinged lightly with brown; head, mesothorax, and metathorax (the latter anteriorly and laterally only) dark brown; legs yellow and antennæ light lemon-yellow. Sculpture and reticulation very strong. Vertex of head broadly raised, arcuate, with a median break; cheeks converging from behind eyes, slightly sinuate. Maxillary palpi apparently 4-jointed, the basal joint as long as the other three (? or two) together. Antennæ set below vertex, distant at base, very slender, and more than twice as long as the head; joints 3 to 6 more or less claviform; 3 as long as the two basal joints together, 4 slightly shorter than 3, and 5 and 6 about two-thirds (·66) the length of 4. Prothorax shorter than the head. Wings with cilia (which are smoky brown) on lower margins only; lower wing with dark median vein from base to apex.

In my two preparations with wings expanded I have been, as yet, unable to make out any arrangement of spines.

♂.—Length 1·15 mm.

Abdominal sternites 3 to 7 (? 2 to 6) with a roundish pale depression. Tenth abdominal segment with a pair of stout lateral bristles, which are apically strongly flattened out in the form of a broad **V**, with the apex truncate.

Hab. Ceylon, on vine (*E. E. Green*).

Readily separated from *Retithrips ægypticus*, Marchal, by its coloration, the long slender antennæ, and the shape of joints 3 to 6, and the longer and more slender wings. Dr. Marchal does not describe any special characteristics of the ♂ *ægypticus.*

Heliothrips indicus, sp. n.

♀.—Length 1·2 mm.

In *fasciatus*, *fasciapennis*, and *phaseoli* group, but readily distinguished by the male characteristics. Type of coloration (except wings) and form of antennæ as in *fasciatus.* Maxillary palpi two-segmented. Wings overreaching tip of abdomen; fore-wings white, tinged with grey at base, second and third fourths wholly grey-brown, decidedly lighter in middle, though the colouring is not broken; apical fifth grey-brown. Venation as in *fasciapennis*; basal vein set with two basal spines and one near fork; upper vein (fused with costa) with two near fork and two near apex; lower vein with five or six (usually 2 + 3 + 1) more or less regularly placed spines.

♂.—Length 1·0 mm.

Ninth tergite with six rather long dorsal spines, one set on each side of the mid-line at a little distance from the posterior margin, and the other four in a line (but the inner pair set wider apart than the first-named pair) near the posterior margin. Abdominal sternites 3 to 7 with a strongly transverse pale area or depression, more or less arcuate, gradually lessening in size from the fourth to the seventh segment, the former being about fifteen and the latter eight times as wide as long. In *cinctipennis*, Hood, these pale areas are almost round, in *fasciatus*, Perg., they are transversely ovate, whilst in *fasciapennis*, Hinds, and *phaseoli*, Hood, they are transverse, but only five and nine times as long as wide respectively, and not arcuate.

Hab. INDIA: Sirsiah, Bengal, in numbers on indigo, 1908; and Surat, Bengal, on onions, berseem, and brinjal, February 1909 (*Maxwell Lefroy*).

Euthrips (*Anaphothrips*) *alternans*, sp. n. (Maize thrips).

♀.—Length 1·3 to 1·4 mm.

Head and first two abdominal segments dark grey-brown; pterothorax yellowish-brown to grey-brown; abdominal segments 7 to 10 dark chestnut-brown, 6 generally a similar c lighter chestnut-brown; prothorax, legs, and abdomin segments 3 to 5 yellow at most lightly tinged with gr

Antennal joint 1 light grey-brown; 2 darker brown, concolorous with the head; 3 clear lemon-yellow; 4 also yellow, but slightly deeper, and in some specimens tinged lightly with grey; 5 (except base, which is light) to 8 chestnut-brown. Wings very light grey; a dark greyish-brown patch across each fore wing from the basal fifth to about the middle; hind vein with dark median vein extending almost to tip.

Head as long as, or very slightly longer than, broad, about as long as the prothorax, and 0·5 the length of the antennæ. Antennal joint 6 not divided; prothorax without setæ at posterior angles. Wings broad near base, a few spines on both upper and lower veins of fore wing, irregularly placed and inconspicuous.

Hab. EGYPT: Bahteem, near Cairo, May 1st, 1911, common on maize (*F. C. Willcocks*).

E. alternans closely approaches *E. sudanensis* (Tryb.), but is sharply distinguished by the lighter basal joint of antennæ, the yellow prothorax, and the long head. It is also a larger insect.

Physothrips lefroyi, sp. n. (Tea-flower thrips).

A very distinctive species.

♀.—Length 1·4 to 1·7 mm.

Yellowish-white, lemon-yellow to yellow in darker specimens; bristles, cilia of wings, and antennal joints 2, 4, and 6 rich reddish brown. Antennal joint 4 basally yellow, and 5 only lightly tinged with reddish brown. Relative length of joints 3 to 8 as follows:—26 : 26 : 21 : 21 : 3 : 5.

Spines in upper vein of fore wing 2 + 3 near base, 1 near middle, and 2 in distal third. Apical abdominal spines long.

♂.—Slightly smaller. Ninth tergite with six stout dorsal spines; four moderately long, forming an obverse arc, and a pair of shorter and stouter ones placed on a higher plane and medianly within the circumference of the arc. Spines and cilia more lightly coloured and antennæ practically unicolorous.

Hab. INDIA: Lebong, Darjeeling, Bengal, in the flowers of tea, Feb. 6th, 1909 (*Maxwell Lefroy*).

Named in honour of Prof. Maxwell Lefroy.

Physothrips funtumiæ, sp. n. (Rubber thrips).

♀.—Length 1·45 to 1·6 mm.

Colour dark grey-brown; legs rather lighter and fore-tibiæ yellowish-brown to yellowish-white at tips; intermediate (and usually hind) tibiæ yellowish-white at tips. Fore-wings and cilia smoky yellowish-brown, lighter at base. Eyes coarsely facetted, pilose. Relative lengths of antennal joints 3 to 8 as follows:—20 (with stem) : 20 : 16 : 21 : 4·5 : 7·5. Third broader than any of the succeeding joints; fifth and sixth rather slender. Prothoracic bristles at posterior angles 0·65 the length of the prothorax. Legs sparingly clothed with setæ. Upper vein of fore-wing with 3+3 spines in the basal half near base, and only two spines in the distal half, together near tip. Apical abdominal spines long.

♂.—Length 1·0 to 1·1 mm., and more slender than ♀. Each of the sternites 3 to 7 with a strongly transverse pale depression near upper margin*, and numerous, more or less small, irregular (but inclined to be roundish) areas of a similar nature placed irregularly over the whole of the surface. Ninth tergite with four short, stout, dorsal spines in the form of an obverse arc, inner pair more apical and shorter than the outer pair. Colour lighter; third antennal joint yellowish-white and joints 4 to 6 also yellowish-white in their basal halves.

Hab. AFRICA: on rubber-trees (*Funtumia elastica*), Uganda and Southern Nigeria (from several correspondents).

Physothrips usitatus, sp. n.

♀.—Length 1·6 mm.

Near *P. sjöstedti* (Tryb.). Colour brown, third antennal joint yellowish-brown to greyish-yellow; fore-femora (in *sjöstedti* dark) yellow, lightly tinged with brown, especially on the outer margin; fore-tibiæ, all tarsi, and intermediate and hind-tibiæ at extreme apices yellow. Fore-wing lightly tinged with brown at extreme base; clear to basal third and thence brown to apex, with a lighter patch just before apex; mid-vein of hind-wing extending to apex, brown; all spines and cilia dark. Head almost as long as broad and not quite as long as prothorax. Interocular bristles long. Antennæ 2·5 times as long as the head; relative lengths of joints:—13 : 15 : 23 : 23 : 14 : 21 : 6 : 8. Double trichomes on joints 3 and 4 long and stout. Middle joint of maxillary palpi the shortest. Upper vein of fore-wing with three basal bristles, a series of 11 (10–13) commencing at about the first fourth and running to, or just into, the distal third, and 2 at extreme apex; lower vein with series of 13 (12–15) bristles com-

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* These may be broken up into a line of smaller depressions.

mencing at basal third. Body elongate, only slightly broader than the pterothorax. Apical segment about 0·2 shorter than ninth abdominal segment; bristles long, nearly as long as the two apical segments together.

This species differs from both *sjöstedti* (Tryb.) and *variabilis*, sp. n., in the long series of bristles in the lower vein commencing at the basal third, instead of with the corresponding series of upper vein at the basal fourth.

Hab. INDIA: Allahabad, in flowers of *Butea frondosa* (*A. D. Imms*).

Physothrips variabilis, sp. n.

♀.—Length 1·1 to 1·6 mm.

Near *sjöstedti* (Tryb.) and *usitatus*, sp. n., but broader. Dark specimens dark chestnut-brown; third antennal joint yellow; fore-tibiæ yellowish; intermediate and hind-tibiæ grey-brown; all tarsi yellowish. Light specimens light-grey to yellowish-brown; pterothorax lighter and abdominal segments 1 to 7 yellowish, only slightly tinged with grey-brown. Fore-wings and cilia light greyish-yellow, a lighter patch near apex; basal third clear. Upper vein with three basal spines, a series of 9 to 14 commencing at about the first fourth, and running well into the distal fourth on to the distal fifth; 2 at extreme apex. Spines of lower vein commencing also at the distal fourth. Head transverse, shorter than prothorax; eyes pilose. Relative lengths of antennal joints 3 to 8:—23 : 24 : 16 : 24 : 5 : 6. Double trichomes on segments 3 and 4 very large. Abdominal bristles long. Legs sparingly spinose.

Differs from *sjöstedti* (Tryb.) and *usitatus*, sp. n., by the broad form and transverse head and by the long series of spines in the upper vein of fore-wing extending to beyond the basal fourth.

Hab. COMORO ISLANDS?: "R. Oberthür, Coll. Marie. Mayotte?" (Leyden Museum).

Thrips assimilis, sp. n.

♀.—Length 1·1 mm.

Closely resembles *T. albopilosus*, Uzel, but is larger and differs in the following particulars:—Relative lengths of antennal joints 3 to 7:—18 : 15 : 12 : 18 : 6; 5 distinctly shorter than 4 and 5 and 6 both broader than 3 or 4. Upper vein in fore-wing with 12 bristles, viz. 6+1 in basal half and 5, more or less regularly placed, in distal half.

Hab. TUNIS: Sousse, 1 ♀, Feb. 28th, 1903 (*Biro*).

Suborder TUBULIFERA.

Family **Phlœothripidæ.**

Compsothrips reuteri, sp. n.*

♀.—Length about 2·0 mm.

Dark chestnut-brown, including legs and tarsi. Basal antennal joint brown; 2 shaded to yellow apically; 3 clear yellowish-white; 4 to 6 yellow, with 5 lightly and 6 more strongly shaded with brown apically; 7 brown and 8 yellowish-brown, lighter than 7. Head about 2·5 times as long as the prothorax, and 1·75 as long as broad behind eyes; cheeks slightly arcuate at about the posterior third. Pterothorax slightly longer than broad. Abdomen oblong-ovate, sharply narrowed from segment 8 to base of tube. Tube about 0·6 the length of the head and less than half (0·5) as broad at apex as at base. Legs long.

Resembles *C.* (*Leurothrips*) *linearis* (Bagn.) in type of coloration, but may be recognized by its smaller size, broader, more ovate, and shorter body, and the relatively longer head and legs.

Hab. EGYPT: Suez, 1 ♀, Aug. 4th, 1902 (*Biro*).

Cryptothrips trybomi, sp. n.†

♂.—Winged; length just over 2·0 mm.

Colour chestnut-brown, head yellowish brown, and tip of tube lighter; all legs yellow, wings tinged lemon-yellow; antennæ yellowish-brown, joint 3 lemon-yellow and 4 a deeper yellow. Head about 1·6 times as long as broad and 2·2 as long as the prothorax. Mouth-cone broadly rounded, extending to mesosternum. Eyes rather small, vertex raised. Ocelli large; postocular bristles present. Antennæ 1·75 times as long as head, joints 3 and 4 mildly claviform, and 5 and 6 elongate-fusiform, almost cylindrical. Prothorax strongly transverse, 2·5 times as wide through middle as long; all bristles present, long and light-coloured. Legs long. Nine cilia near apex of fore wing duplicated. Abdomen elongate; tube 0·6 the length of the head.

Hab. GERMAN EAST AFRICA: Moschi, Aug. 15th, 1905, 1 ♂ (*C. Katona*).

Easily distinguished by its type of coloration and by the unusual form of the antennal joints 5 and 6.

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* Named in honour of Prof. O. M. Reuter, Helsingfors.

† Named in honour of the late Dr. Filip Trybom of Stockholm.

Cryptothrips citricornis, sp. n.

♂.—Forma *aptera*.

Length about 2·5 mm.

Elongate and linear. Colour chestnut to grey-brown; metathorax and abdominal segments 1 to 7 lighter, tinged with yellow. Antennæ yellow, sixth joint very faintly and the penultimate and apical joints tinged with grey; all femora grey-brown, with the extreme apices faintly yellowish; all tibiæ and tarsi lemon-yellow. Hypodermal pigmentation deep and widely diffused.

Head almost as in *icarus*, Uz., not quite 1·5 as long as broad just behind the eyes (where it is broadest), and nearly twice as long as the prothorax, which is strongly transverse. Ocelli moderately large, remote from inner margins of eyes. Postocular and all prothoracic setæ well developed, yellow. Wings and wing-retaining spines absent. Tube about 0·65 the length of the head and 2·3 times as long as broad at base. Apical bristles nearly as long as tube.

Related to *icarus*, Uz., from which it may be distinguished by its larger size, more elongated body, and also by its yellow antennæ, and the dark femora and light yellow tibiæ.

Hab. GERMAN EAST AFRICA: Arusha, Oct. and Nov., 1905 (*C. Katona*).

Haplothrips karnyi, sp. n.*

♀.—Length about 1·9 mm.

Colour dark grey-brown; crimson hypodermal pigmentation widely diffused; fore-tibiæ yellowish. Antennal joints 3 to 5 light yellow; 6 also yellow, tinged with light greyish-brown apically; 7 yellowish grey-brown, and 8 darker brown. Wings with a smoky tinge. Head and prothorax almost as in *kilimandjaricus* (Tryb.); head 1·35 as long as broad and about 1·5 times as long as the prothorax. Postocular and all prothoracic setæ long and stout, knobbed. Mouth-cone reaching a little more than halfway across prosternum. Prothorax 1·6 broader than long. Fore-tarsus with a small tooth. Posterior margin of fore-wing with seven cilia duplicated near apex. Tube 0·6 the length of head; abdominal bristles long and moderately stout, wing-retaining bristles stout.

H. karnyi comes nearest to *cahirensis* (Tryb.) and *kilimandjaricus* (Tryb.), differing from both in the more greatly developed postocular and prothoracic setæ, and in the long

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* Named in honour of Dr. H. Karny of Elbogen.

abdominal bristles, those on segments 7 to 9 being nearly as long as the tube. It differs from *usitatus* (Bagn.) in this latter respect and also in the longer head and prothorax.

Hab. GERMAN EAST AFRICA; Arusha, Oct. and Nov., 1905 (*C. Katona*).

Haplothrips longisetis, sp. n.

♀.—Length about 1·75 mm.

Elongate and linear. Brown, first abdominal segments somewhat lighter; tube darker basally; femora grey-brown; tibiæ yellow, tinged with brown on the outer margin and basally; third antennal joint yellow, fourth rather lighter brown than the succeeding joints. Wings colourless, transparent, posterior margin of fore-wing with four cilia duplicated near apex. Head 1·14 as long as broad, about 1·25 as long as the prothorax, and about 0·6 the length of the antennæ. Mouth-cone very short and rounded. Prothorax 1·6 as broad as long; all setæ present, knobbed. Fore-tarsus with prominent tooth. Tube 0·58 the length of the head; apical setæ exceptionally long, 2·25 times as long as the tube; those on ninth abdominal segment 1·5 the length of the tube.

H. longisetis comes in the *aculeatus* group, but is readily recognized by the long apical abdominal hairs.

Hab. ALEXANDRIA: one example found in a dead twig of fig (*Ficus* sp.), March 6th, 1905.

Submitted by Mr. F. V. Theobald.

Haplothrips brevicollis, sp. n.

♀.—This species has the fore-tarsus unarmed and comes nearest to *cahirensis* (Tryb.). It may be separated from all the species in that group, however, by its very short and strongly transverse prothorax. The head is nearly 0·9 as broad as long and 1·85 times the length of the prothorax, which latter is 2·3 times as broad as long. The tube is 0·6 the length of the head. The posterior margin of the fore-wing has six cilia duplicated near the posterior margin.

Hab. AFRICA: Kibosho, 1903 (*Kittenberger*).

Hoplandrothrips hoodi, sp. n.*

Forma *macroptera.*—Length 1·2 to 1·5 mm.

Colour yellowish-brown to grey-brown; tube grey-brown, darker near basal third and laterally. Antennæ with joints 1 to 3 yellow; 4 and 5 light brown, with basal thirds yellow; 6 light brown, with basal fourth yellow; 7 and 8 brown. All femora light brown, shaded to yellow apically; fore-tibiæ yellow, and intermediate and hind-tibiæ yellowish distally and basally. Hypodermal pigmentation thick.

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* Named in honour of the American Thysanopterist, Mr. Douglas Hood.

Head twice as long as prothorax and about 1·25 times as long as wide; cheeks bulging behind eyes, and from thence converging to base. Eyes finely facetted; ocelli moderately large. Postocular bristles present, knobbed. Mouth-cone extending across prosternum. Antennæ more than twice as long as the head. Prothorax strongly transverse, 2·3 times as wide through middle as long; all bristles present, knobbed. Nine cilia near apex of fore-wing duplicated. Fore-legs stout and tarsi armed; fore-tibia in the ♂ with one tooth near base, and femur with two teeth near apex within; in the ♀ simple. Abdomen roundly narrowed from segment 6 to base of tube. Tube about 0·5 times the length of head. Apical bristles almost as long as tube. Abdominal bristles well-developed; segments 3 to 8 with one shorter stout pair and one straight knobbed pair.

Forma *aptera*.—Wings and wing-retaining spines absent.

Hab. GERMAN EAST AFRICA: Arusha, f. *macroptera*, 1 ♂, f. *aptera*, 1 ♂ and 1 ♀, Oct.–Nov., 1905 (*C. Katona*).

Trichothrips longicornis, sp. n.

Forma *aptera*.—Length about 1·6 mm.

Yellowish to chestnut-brown, head and abdomen generally darker; tube shaded to yellow at apex. Fore-tibia, at least apically, yellowish; basally and along the upper and lower margins dark brown. Antennæ with basal joint concolorous with head; 2 yellowish, tinged with brown basally; 3 to 6 clear lemon-yellow, 6 sometimes faintly tinged and 7 and 8 very lightly tinged with brown.

Head quadrate, only 0·08 longer than broad and about 1·5 times as long as the prothorax; cheeks parallel to basal fourth, then slightly narrowed posteriorly. Eyes well-developed; front ocellus facing forwards; postocular bristles long. Mouth-cone broadly rounded, not quite reaching across the prosternum. Antennæ about 2·2 times the length of head, set below vertex; relative lengths of antennal joints 3 to 8 as follows:—20 : 19 : 20 : 21 : 23 : 18; two apical joints slender.

Prothorax transverse, 0·5 as long as broad; pterothorax nearly as broad as the width across fore-coxæ, slightly broader than long. Abdomen elongate, almost parallel to segment 7. Tube about 0·7 the length of the head. Abdominal spines pointed.

Nearest *T. femoralis*, Moulton, from which it may be distinguished by the shorter and more transverse prothorax, the relative lengths of the distal antennal joints, the shorter tube, and the colour of the fore-tibia and tube.

Hab. WEST AFRICA: Sierra Leone.

Numerous dried specimens in the British Museum.

From the ANNALS AND MAGAZINE OF NATURAL HISTORY,
Ser. 8, Vol. xiii., *January* 1914.

Brief Descriptions of new Thysanoptera.—II. By RICHARD S. BAGNALL, F.L.S., F.E.S. (Hope Department of Zoology, University Museum, Oxford).

Suborder TEREBRANTIA.

Family Thripidæ.

Scirtothrips signipennis, sp. n.

♀.—Length 1·2 mm.

Light lemon-yellow, first antennal joint almost white, 5 distally very lightly tinged with grey, 6 with distal two-thirds (or thereabouts) and 7 and 8 wholly grey-brown. Fore-wings grey-brown, second and apical fifths white or light grey; hind-wings with middle brown, corresponding to the long dark patch of upper wing.

Head transverse, about 0·8 as long as broad. Eyes rather large and coarsely facetted, pigment very deep purplish black; ocelli with crimson crescentic margins. Antennæ twice as long as the head, slender; relative lengths of joints approximately:—16 : 22 : 32 : 30 : 32 : 32 : 7 : 13—1 and 2 much broader than any of the following, and 6 not divided. Double trichomes on 3 and 4 long and very slender. Mouth-cone short, brown at tip; maxillary palpi 3-jointed, joints 2 and 3 practically subequal in length.

Prothorax about as long as head and about 1·6 times as broad as long, surface sparsely and irregularly set with very minute setæ; one postero-marginal spine near each hind-angle, short, only 0·25 the length of prothorax. Legs somewhat stout, hind-tibia with a series of moderately fine spines on distal half within, and tarsus with a series of similar spines near apex. Pterothorax nearly 1·45 times as broad as the prothorax, and about as long as broad. Wings slender, reaching only to the sixth abdominal segment; cilia fuscous, those of hind margins very long; fore-wing with three minute, widely spaced setæ on distal half of upper vein, and lower vein with but four setæ. Hind-wing with median vein continued almost to apex, very prominent through dark area.

Abdomen elongate-ovate, dorsal surface finely and wavily striate, in parts reticulate; segments 9 and 10 with moderately long and rather fine bristles, 9 being furnished with a shorter dorsal pair which are somewhat widely separated.

This species somewhat closely resembles *Euthrips cingulatus*, Karny, from which it is easily separated by the prothoracic bristle at each hind-angle, the uniform light yellow colour of body, and the coloration of the antennæ. The coloration of the wings is about the same. The relative lengths of the antennal joints are also distinctive.

Type. In British Museum of Natural History.

Hab. CEYLON: Peradeniya, 1 ♀ taken by Mr. A. Rutherford from under leaf-sheaths of banana, 16. 6. 13 (Entomological Research Committee).

Pseudothrips glaucus, sp. n.

♀.—Length 0·95, breadth of mesothorax 0·28 mm.

General colour light grey-brown, apex of abdomen slightly darker; legs somewhat lighter than the body. Antennæ darker grey-brown, with joints 1 and 3 a little lighter. Wings greyish yellow.

Head transverse, about 0·65 as long as broad, practically as long as prothorax. Mouth-cone almost reaching across prosternum; palpi rather long. Antennæ more than twice as long as head; joint 3 pedicellate, 6 simple, not divided. Relative lengths of joints approximately:—10 : 22 : 27 : 24 : 22 : 26 : 5 : 8.

Prothorax 1·85 times as broad as long, one long and stout bristle near each hind-angle. Pterothorax large. Legs moderately long and stout. Wings long, reaching almost to tip of abdomen; upper vein of fore-wing with an unbroken series of 15–18, and lower vein with 13–15 setæ.

Abdomen elongate-ovate, posterior margin of eighth tergite fringed. Bristles at hind-margin of ninth tergite long, but those of tenth comparatively short, excepting a pair of long dorsal bristles.

This species is easily separated from *P. inequalis* (Beach) by its colour, the undivided sixth antennal joint (and relative lengths of joints), shorter prothorax, and presence of dorsal bristles on tenth abdominal segment.

Type. In Hope Collections, University Museum, Oxford.

Hab. Cape Town, 1 ♀ from *Sebæa* (*Dr. R. Marloth*).

Physothrips antennatus, sp. n.

♀.—Length 1·3 to 1·4 mm.

Colour dark brown, crimson hypodermal pigmentation especially noticeable in thorax. Fore-femora basally and all tibiæ distally shaded to pale yellowish-white, all tarsi yellow. Basal half of third antennal joint light yellowish-brown and distal half (the constricted part) of both 3 and 4 lighter than the basal half. Wings grey-brown.

Head 0·8 as long as broad across eyes, and nearly as long as the prothorax; cheeks gently diverging to base. Antennæ 2·7 times as long as the head; relative lengths of joints 3–8 approximately:—38 : 56 : 30 : 40 : 7 : 13. Joint 4 curiously constricted and produced in the form of a stem distally.

Fore-wing with a series of 10 spines in upper vein, commencing at the basal fourth and extending to the distal third, and 2 at apex; lower vein with a series of 13, commencing just beyond the first bristle in the long series of upper vein.

Abdomen elongate, ninth segment with a pair of dorsal bristles in addition to the postero-marginal series.

This species comes near to *sjostedti* (Tryb.), *usitatus*, Bagn., and *variabilis*, Bagn., but is readily separated from these and all other described species of the genus by the long fourth antennal joint and its curious distal stem.

Type In British Museum of Natural History.

Hab. Uganda (*C. C. Gowdey*). Mr. Gowdey writes that this species feeds on the spores of the coffee-fungus, *Hemeleia vastatrix*.

Thrips hololeucus, sp. n.

♀.—Length 1·0–1·2, breadth of mesothorax 0·27 mm.

Colour to the unaided eye white, under a moderate power from very light greyish-yellow to a deeper shade in dark specimens. Antennæ with the first joint white or colourless, 2–7 light greyish-brown, basal halves of 3 and 4 lighter, and 5 also lighter basally.

Head transverse, 1·37 times as broad as long, and not quite as long as the prothorax; posterior fourth faintly and irregularly transversely striate. Cheeks gently arcuate; mouth-cone pointed, reaching across prosternum, maxillary palpi long and slender, third joint the longest. Eyes occupying one-half the length of the head, coarsely facetted, pilose; pigmentation deep black. Ocelli with yellowish crescentic hypodermal pigmentation, a short curved seta on each side of the anterior one. A series of short dorsal setæ on an irregular line drawn behind the eyes. Antennæ with basal joints subapproximate, 2·25 times as long as the head; third joint pedicellate; relative lengths of joints as follows:—8 : 13 : 17 : 16 : 13 : 17 : 5—2 distinctly broader than any of the following, 5 and 6 somewhat broadly united; double trichomes on 3 and 4 slender and only moderately long.

Prothorax 1·5 times as broad as long, surface faintly and irregularly striate; the two bristles at each posterior angle from 0·3 to 0 34 as long as the prothorax, stout; a series of short postero-marginal setæ, of which the inmost pair is slightly the longest. Dorsal surface irregularly set with setæ. Pterothorax about as long as broad. All legs fairly long and stout, sparingly setose, setæ on the fore-margins of all tibiæ forwardly curved; hind tibiæ with series of short spines on distal third within. Wings reaching to ninth abdominal segment, faintly tinged greyish-yellow; cilia and spines dark. Costa and veins of fore-wing distinct; upper vein with a series of 4–5 basal setæ, 3 terminating at juncture with lower vein, then 4 widely and somewhat regularly spaced ones occupying the distal half; costa with 28 setæ, increasing in length distally, those towards the apex being as long or longer than the breadth of the wing; lower vein regularly set with 15–16 setæ. Cilia on fore-margins of both pairs somewhat sparse and widely spaced; on hind margin close, long, and wavy.

Abdomen elongate-ovate, about twice (or a little more) as long as broad; segments 2 and 3 the broadest, gently narrowing from 3 to 7 and thence more sharply to tip. Eighth tergite with a very fine fringe. Terminal bristles on 9 and 10 long and stout, about 1·5 times as long as the respective segments bearing them, and 9 with a pair of shorter dorsal bristles. Lateral abdominal bristles moderately long and stout, all light greyish-brown.

A distinctive species.

Type. In Hope Collections, University Museum, Oxford.
Hab. JAPAN: Kobe, July 1913 (*J. E. A. Lewis*).

Thrips albipes, sp. n.

♀.—Length 0·9 to 1·1, breadth of mesothorax 0·24 mm.

Head yellowish-white, with greyish-brown cheeks; prothorax golden-yellow; pterothorax also golden-yellow, but deeper and usually shaded with brown. Abdomen rich brown, first (and sometimes the second) segment lighter; all setæ dark. All legs yellowish-white or light lemon-yellow. Antennæ with first segment grey, 3 and sometimes extreme base of 4 light lemon-yellow; 2 and 4 to 7 brown, 2 sometimes lighter distally. Fore-wings smoky-brown, basal fourth light.

Head almost as in *hololeucus*, about 1·25 times as broad as long, and about as long as the prothorax. Eyes as in *hololeucus*, pigmentation deep purplish-black; ocelli with crimson crescentic pigmentation. Mouth-cone not quite reaching across prosternum; maxillary palpi long, with middle joint the shortest; labial palpi long and slender. Antennæ about 2·3 times as long as the head; relative lengths of joints approximately:—7 : 12 : 17 : 16 : 12 : 17 : 5—2 broader than any of the following, 3 pedicellate, and 5 and 6 rather broadly jointed.

Prothorax 1·5 times as long as broad, with setæ as in *hololeucus*, dorsal surface not striated. Pterothorax about as broad as long. Legs as in *hololeucus*, hind-tibiæ shorter, with a series of short setæ on the distal half within. Wings reaching to the ninth abdominal segment, fore-wings about 15 times as long as broad across middle. Veins of fore-wing not distinct, upper vein with 3 widely-spaced setæ in distal half; lower vein with a series of 14 and costa 26 to 30 setæ. Cilia as in *hololeucus*. Hind-wing with a dark median vein to apex.

Abdomen ovate or, when segments are fully extended, elongate-ovate, apically rather sharply narrowed and pointed. Eighth tergite very finely fringed. Terminal bristles long, ninth segment with a pair of short widely-separated bristles (0·3 to 0·4 the length of the long ones), which are inwardly directed distally. Lateral abdominal bristles somewhat long.

Also a distinctive species.

Type. In Hope Collections, University Museum, Oxford.

Hab. JAPAN: Okinawa, Luchu Is., on nasturtium, May, and at Kobe, with *T. hololeucus*, sp. n., July 1913 (*J. E. A. Lewis*).

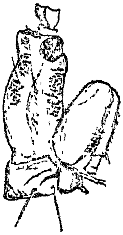
Suborder TUBULIFERA.

Docessissophothrips frontalis, sp. n.

Length about 5·5 mm.

Colour deep blackish-brown; fore-tibiæ light yellowish-brown, all tarsi dark yellowish-brown; wings smoky-brown, cilia darker. Antennæ absent in the unique example.

Head twice as long as broad, almost as in *D. major*, Bagn., but with the vertex produced into a prominent hump, with the front margin truncate and having the anterior ocellus on the truncate plane facing forwards. The posterior three-fourths is dorsally gently and evenly arcuate, and the surface is irregularly and rather deeply furrowed dorso- and ventro-laterally. Cheeks set with numerous short setæ. Postocular bristles long and colourless; a second shorter and weaker pair set within the longer pair and on about the same line.



Docessissophothrips frontalis, sp. n. Head and prothorax viewed laterally, with right front leg.

Prothorax as in *D. major*, bristles at the anterior and posterior angles, together with mid-lateral and postero-marginal pairs, long, slender, and colourless; those on posterior margin the longest. Pterothorax as broad as width across the fore-coxæ and only slightly longer than broad. Wings reaching to the eighth abdominal segment. Fore-femora and tibiæ apparently without the long conspicuous bristles seen in *D. major*; inner margin of fore-tibiæ with numerous rather long setæ (as long as the breadth of the tibia).

Abdomen elongate, gently and roundly narrowed from seventh segment to base of tube. Tube about 0·65 the length of the head, terminal hairs very weak, about 0·7 as long as tube, colourless distally. Bristles on ninth segment about as long as the tube, colourless; other lateral abdominal bristles moderately long, faintly tinged with yellow, or colourless.

Type. In Hope Collections, University Museum, Oxford.

Hab. JAPAN: one example collected by Mr. John E. A. Lewis.

Androthrips flavipes, sp. n.

♂.—Length about 2·3 mm.

Thorax and abdomen dark grey- to blackish-brown, the former a little less deep in colour; head yellowish-brown, with cheeks dark greyish-brown. All legs (excepting coxæ) yellow. Antennæ with joints 1 and 2 dark brown, the latter lighter apically; 3 and 5 yellow, with very faint tinge of grey distally; 4 yellow, grey-brown near apex; 6 yellow, distinctly tinged with grey distally; and 7 and 8 light grey-brown.

Head approximately 1·2 times longer than broad and 1·5 times as long as the prothorax, sides parallel. Mouth-cone exceptionally short, maxillary palpi with second joint very long. Antennæ 1·55 times as long as the head, joints 3 and 4 much broader than any of the others. Relative lengths of joints approximately:—12 : 18 : 22 : 22 : 19 : 18 : 17 : 12.

Prothorax transverse, about twice as broad as long; bristles at posterior and anterior angles, and the mid-lateral and postero-marginal pairs present. The postero-marginal pair and those at posterior angles long, the latter 0·6 as long as the prothorax. Pterothorax transverse. Fore-femora strongly incrassate, with a stout, blunt, tooth-like projection at the base within, the inner margin straight and set with a few very minute "teeth." Fore-tarsus set with a stout, sharp, curved tooth.

Wings practically clear, rather broad; fore-wings apparently not constricted as in *Haplothrips*, with 8–11 duplicated cilia.

Abdomen about as broad as the pterothorax, elongate, narrowing evenly from sixth segment to base of tube. Tube 0·6 the length of head, about twice as long as broad at base, and twice as broad at base as at apex. Terminal hairs longer than tube, but very slender (and difficult to see) distally, colourless, except near base. Lateral abdominal bristles long and slender, faintly knobbed; none so long as the tube.

Type. In the British Museum of Natural History.

Hab. CEYLON: Peradeniya, 1 ♂ taken by Mr. A. Rutherford from *Memexylon umbellatum*, 28. 6. 13 (Entomological Research Committee).

Gynaikothrips karnyi *, sp. n.

Length 1·9, breadth of mesothorax 0·42 mm.

Colour deep blackish-brown, thorax and distal half of tube not quite so dark; all tibiæ and tarsi light lemon-yellow, and antennal joints 3–8 lemon- to golden-yellow.

Head about 1·42 times as long as broad and practically twice as long as the prothorax ; sides parallel. Mouth-cone reaching across prosternum, somewhat pointed. Eyes occupying about one-third the length of the head, finely facetted ; postocular bristles moderately long and stout. Vertex raised in form of a hump. Ocelli large. Antennæ 1·5 times as long as the head ; relative lengths of joints approximately :—10 : 16 : 23 : 22 : 22 : 21 : 18 : 13—7 and 8 broadly jointed, 8 narrowly pyriform, pointed apically.

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* Named in honour of Dr. H. Karny, who has done so much work on gall-thrips.

Prothorax very short and strongly transverse, at least 2·3 times as broad across posterior angles as long ; all bristles present, long and rather stout, pointed ; postero-marginal pair 0·8 as long as the prothorax. Pterothorax a little wider than width across fore-coxæ and as long as broad. Legs normally stout and long. Wings reaching to eighth abdominal segment, cilia smoky.

Abdomen about as broad as the pterothorax, gently narrowing from fifth segment. Tube 0·6 as long as the head, slightly more than twice as long as broad at base, and twice as broad at base as at apex. Terminal hairs coloured at base and continued as long colourless filaments, about 0·85 as long as the tube. Lateral abdominal bristles yellow, long and rather stout on segments 6–8 at least ; those on 9 particularly long and very slender (and indistinct) apically, up to 1·7 times the length of the tube.

Type. In the British Museum of Natural History.

Hab. CEYLON : Peradeniya, ex marginal leaf-galls of black pepper (*Piper nigrum*), A. Rutherford, 21. 7. 13 (Entomological Research Committee).

Œdemothrips (?) *brevicollis*, sp. n.

♀.—Length 1·9, breadth of mesothorax 0·4 mm.

Colour of abdomen black, first segment brownish ; thorax grey-brown ; head yellow to yellowish-brown, cheeks darker. Antennæ with joints 1 and 2 yellow, 3–5 yellow, lightly shaded with grey, the fifth darker ; 6 chestnut-brown, rather lighter at base, and 7 and 8 dark blackish-brown.

Head only 0·9 as long as broad, and as long as the prothorax, cheeks feebly arcuate, converging towards base. Eyes occupying about 0·34 the length of head. Ocelli small, posterior pair widely separated, almost touching the inside margins of eyes. Postocular bristles about as long as the eye, and interocular pair only about 0·5 as long. Antennæ nearly twice as long as the head ; relative lengths of joints approximately : — 14 : 19 : 23 : 21 : 20 : 19 : 14 : 9. Joint 2 constricted near base, 3 clavate, 4 and 5 roughly clavate, 6 with apex rather broadly truncate, and 7 and 8 broadly united.

Prothorax about 2·3 times as broad as long; bristles at hind-angles and the postero-marginal pair present, the first-named long, about 0·5 as long as prothorax. Pterothorax transverse, about 1·25 times as broad as long. Legs rather stout and long; each intermediate and hind-femur with a short stout seta on the outer margin beyond middle. Wings absent.

Abdomen elongate-ovate, 0·65 the total length of the insect, broadest at about fifth segment, where it is 1·4 times as broad as the mesothorax.

Tube stout, about 0·8 as long as the head, 1·75 times as long as broad at base and less than 0·5 as broad at apex as at base; terminal hairs short and weak, not quite 0·6 as long as the tube. Lateral abdominal bristles not long, but noticeably strong, especially those on segments 7–9.

Type. In Hope Collections, University Museum, Oxford.

Hab. JAPAN: Okinawa, Luchu Is., 1 ♀ collected by Mr. J. E. A. Lewis.

Trichothrips lewisi, sp. n.

♂.—Length about 1·45, breadth of mesothorax 0·285 mm.

Colour lemon-yellow, antennæ very lightly tinged with grey: first two antennal joints, frons and cheeks, distal half of mesothorax, sides of pterothorax, first abdominal segment, and the anterior corners of segments 2–8 shaded with grey-brown.

Head 1·1 times as long as broad and 1·3 as long as the prothorax. Cheeks constricted behind eyes and near base. Eyes prominent, occupying 0·35 the length of the head, widely separated. Ocelli rather large, posterior ones well apart from inner margins of the eyes. Postocular bristles long and slender; interocular pair rather short. Mouth-cone blunt, broadly rounded at apex, reaching a little more than halfway across prosternum. Antennæ twice as long as the head; relative lengths of joints as follows:—13 : 14 : 20 : 16 : 16 : 16 : 13·5 : 16; apical joint narrowly pyriform.

Prothorax trapezoidal, twice as broad across hind-angles as long, with a distinct median line; mid-lateral, postero-marginal bristles, and pair at hind-angles present, long and slender, the postero-marginal pair the longest. Pterothorax about as long as broad; wings reduced, narrow and vestigial in character, reaching to hind-margin of first abdominal segment. Legs moderately long and stout; fore-femur incrassate, fore-tibia stout, and tarsus armed with a sharp broad tooth, and also with a hidden curved tooth near apex.

Abdomen only slightly broader than the pterothorax, practically subparallel to seventh segment, and thence gently rounded to base of tube; well-developed wing-retaining bristles on segments 2–6. Tube about 0·6 the length of head, 1·6 times as long as broad near base, and about 0·4 as broad at apex as at base, evenly narrowed from base to tip. Terminal hairs about as long as the tube, slender. Lateral abdominal bristles long and slender on segments 1 to 9, mostly as long as or longer than tube.

A very distinct species of the group characterized by the short mouth-cone, and readily recognized by the form of the head, the relative lengths of the antennal joints, and the distinctive type of coloration. I have pleasure in naming the species in honour of its discoverer.

Type. In Hope Collections, University Museum, Oxford.

Hab. JAPAN: Okinawa, Luchu Is., 1 ♂, collected by Mr. J. E. A. Lewis, May 1913.

From the ANNALS AND MAGAZINE OF NATURAL HISTORY,
Ser. 8, Vol. xiii., *March* 1914.

Brief Descriptions of new Thysanoptera.—III. By RICHARD S. BAGNALL, F.L.S., F.E.S. (Hope Department of Zoology, University Museum, Oxford).

Suborder TEREBRANTIA.

Family Æolothripidæ.

Orothrips australis, sp. n.

Colour dark grey-brown; hind legs, including tarsus, unicolorous with body (other legs absent in the type specimen). Mouth-cone rather long, reaching across prosternum; maxillary palpus 7 jointed; labial 3 (?)-jointed. Antennæ dark grey-brown, apex of joint 2 and whole of 3 excepting distal third yellowish-white, extreme base of 4 yellowish-brown; relative lengths of joints approximately:—32 : 60 : 104 : 82 : 52 : 32 : 19 : 12 — joint 3 pedicellate. Very narrow, wavy, elongated, membranous sense-areas in 3 and 4; a short, straight, but otherwise similar area in 4; and a minute sense-cone on each of the joints 5, 6, and 7.

Fore-wings longer and narrower than in *kelloggii*, Moulton, clear white with extreme base and a band across tip dark brown, and a similar but more extensive dark band across middle; setæ along costa and the longitudinal veins minute; cilia of hind fringe up to more than 2·5 times as long as the greatest breadth of wing. All cross-veins included well within the central dark area. Hind-wings with light grey patches corresponding with the dark areas of fore-wings.

Abdominal segment 8 without the pair of stout spines described in *kelloggii*, 9 and 10 with moderately long bristles; tergite 9 about twice as long as 10.

Differs from *O. kelloggii*, Moulton, in the colour and relative lengths of the antennal joints, the longer mouth-cone, and fewer (?) joints in labial palpi; the longer, narrower fore-wings with more extensive dark central area, more minute setæ, and longer cilia; and the lightly banded hind wings.

Moulton says that the labial palpi of *O. kelloggii* are 4-jointed in his key to genera, but 5-jointed in describing the genus and species.

Type. In Hope Collections, University Museum, Oxford.

Hab. AUSTRALIA: one ♀ collected by Mr. A. Eland Shaw from the flowers of a native shrub, *Xanthorrhœa australis*, Healesville, Victoria, Oct. 12, 1913.

Family Thripidæ.

Thrips japonicus, sp. n.

A very distinct species.

♀.—Length about 1·4, breadth of mesothorax 0·3 mm.

Colour yellow, lightly tinged with grey, legs lighter and thorax orange-yellow; setæ dark. Abdominal segments 9 and 10 entirely dark grey-brown, almost black, and all *tergites* lighter or darker grey-brown. Antennal joints 1 and 3 dirty yellowish-white, 2 orange-yellow, 4–7 dark grey-brown, 5 in some specimens more or less yellowish basally. Fore-wings and cilia grey, lighter basally.

Head about 0·75 as long as broad and 0·8 as long as the prothorax; eyes coarsely facetted, pilose, black. Relative lengths of antennal joints 2–7 as follows:—24 : 34 : 32 : 22 : 31 : 7 — 3 pedicellate, and 3 and 4 fusiform.

Prothorax about 1·5 times as broad as long, surface sparsely setose; bristles at posterior angles about 0·4 the length of prothorax. Wings reaching to about the ninth abdominal segment, upper vein of fore-wing with 3 (approximately 1+1+1) setæ in the distal half.

Abdomen elongated, no broader than pterothorax, with segments 9 and 10 sharply narrowed to tip; 10 divided above.

Type. In Hope Collections, University Museum, Oxford.

Hab. Kobe, Japan, not uncommon, Nov. 1913 (*J. E. A. Lewis*).

Suborder TUBULIFERA.

Family Idolothripidæ.

Dicaiothrips stenocephalus, sp. n.

♂.—Length 4·7, breadth of mesothorax 0·72 mm.

Dark brown, including all femora, tibiæ, and tarsi (excepting the fore-tarsi, which are yellowish). Antennal joint 3 light lemon-yellow, brown at apex; basal half of 4, except a narrow ring at extreme base, light yellow, and basal third of 5 yellowish-brown.

Head exceptionally long and slender, 3·3 times as long as broad at broadest; vertex produced; eyes occupying less than 0·2 the length of head; postocular and anteocular bristles long. Antennæ 1·4 times as long as the head, relative lengths of joints 3–8 approximately:—67 : 59 : 50 : 35 : 23 : 22. Mouth-cone very small and short.

Prothorax about 0·4 the length of head. Fore-femur stout, a basal series of very stout dark spines on outer margin in addition to the usual bristles, and a yellow sickle-formed bristle at apex; fore-tibia very short and stout; tarsal tooth rather short.

Tube 0·68 as long as the head, slender; terminal hairs colourless, 0·65 the length of tube and those on tergite 9 not quite as long as tube.

Recognized by the long and slender head.

Hab. GERMAN EAST AFRICA: Moschi, 1 ♂ collected by Mr. C. Katona, Aug. 15, 1905 (National Hungarian Museum).

Dicaiothrips proximus, sp. n.

♂. Near *malayensis*, Bagn., a little longer and much stouter. Anterior femora very greatly enlarged, with a brown sickle-shaped bristle at apex. Head with vertex less noticeably prolonged; postocular bristles present. Antennal joints 3 and 4 subequal; 4 with basal third, and 5 basally yellowish. Prothorax much larger than in *malayensis*, not quite 0·5 the length of the head; disc sloping from basal margin, which is raised. Tube about 0·75 the length of head and longer than either of the abdominal segments 7 or 8; two stout spines on ninth sternite.

Type. In Hope Collections, University Museum, Oxford.

Hab. CEYLON: Peradeniya, 1 ♂ (in association with what is probably the ♀ of the species), from pods of *Crotalaria* sp., November 1912 (*E. E. Green*, No. 3180).

Dicaiothrips greeni, sp. n.

Length 7·2 mm.

This species comes in my first division of the genus, in which the head is produced beyond the eyes for at least the length of the eye and for more than the width at the base of the produced part.

Colour dark brownish-black; fore-tibiæ yellowish-brown; intermediate tibiæ brown, lighter at both ends; hind-tibiæ light at base, and shading to yellow distally. Antennæ with joint 3 yellow, brown at apex, basal half of 4 and third of 5 shaded to a light brown.

Head nearly 3·5 times as long as broad near base, the produced part occupying about 0·25 and the eyes 0·2 the total length. Postocular bristles long, and a second pair of dorsal bristles near basal fourth as in *Anactinothrips*, Bagn., and *Dracothrips*, nov.* Antennæ moderately slender, fourth joint about 0·8 the length of third. Cheeks rather closely set with long and short setæ, somewhat as in *D. grandis*, Bagn.

Prothorax about 0·4 the length of head, setæ only moderately long, those at anterior angles directed forwards. Fore-femora incrassate, with numerous outer marginal setæ, including several unequal-sized longer ones, much as in *D. championi*, Bagn.; setæ light-coloured, a slender sickle-shaped brown spine at apex. Tarsal tooth long and sharp. Hind-legs very long and slender. Wings reaching to the fifth abdominal segment.

Abdomen long, segment 8 a little longer than 7. Tube slender, about 0·75 the length of the head and as long or a little longer than the seventh segment. Terminal bristles 0 8 the length and those on 9 almost as long as the tube.

Type. Hope Collections, University Museum, Oxford.

Hab. Ceylon: Peradeniya, 1 ♂ taken in association with another *Dicaiothrips* not yet determined, from decayed pods of *Phaseolus* sp. (*E. E. Green*, No. 3023). I have pleasure in naming the species in honour of its well-known discoverer, to whom I am indebted for much interesting material and information.

Genus Dracothrips, nov.

Near *Mecynothrips*, Bagn. Head widest at base, narrowing to eyes; eyes finely facetted, prominent; vertex strongly produced, produced part narrow at base and widening to seat of antennæ. Two pairs of dorsal cephalic bristles. Antennæ very long and slender. Prothorax without the long recurved prolongations seen in *Mecynothrips*, and fore-femora unarmed. Tube long.

Type *Dracothrips ceylonicus*, sp. n.

Dracothrips ceylonicus, sp. n.

♂ (?).—Length a little over 7·0 mm.

Head broad at base, narrowing to about 0·7 that width at behind eyes; produced part not 1·5 times as long as eye, narrow at base. Antennæ very slender, about 1·4 times as long as head, joints 3–5 yellow, black at apices, 6 yellow at base; relative lengths of joints 3–5 approximately:—65 : 55 : 40. A pair of dorsal bristles in addition to the postocular pair, and three pairs of rather long genal setæ.

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* It should be noted that *Dicaiothrips denticollis*, Bagnall, a Malayan form, possesses this additional pair of dorsal cephalic bristles.

Prothorax with the bristles at angles set on warts, the front pair set directly forward. Fore-femur not strongly incrassate, with a few long colourless and faintly knobbed bristles. Fore-tibiæ yellowish-red; intermediate tibiæ shaded to yellow distally and hind-tibiæ yellow at knee and distal half.

Abdomen long and slender; tube 0·9 the length of head; bristles on segment 9 about 0·6 the length of tube.

I have not yet had the opportunity of re-examining the type of *Mecynothrips simplex*, Bagn. (in the British Museum), which I think will fall into this genus. *M. simplex* has the fore-femora strongly inflated, shining, sparingly setose, and armed with a short tooth at apex within, and the tube is shorter in comparison with the length of head.

Type. In Hope Collections, University Museum, Oxford.

Hab. CEYLON: Peradeniya, two examples, almost certainly males, swept from bushes (*E. E. Green*, No. 2961). They were in association with *Ecacanthothrips sanguineus*, Bagn.

Family **Megathripidæ.**

Siphonothrips brevis, sp. n.

♂.—*Forma aptera.*

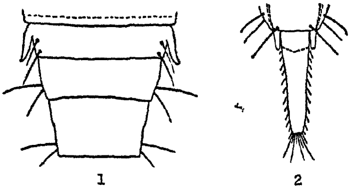
Length 2·1, breadth of mesothorax about 0·38 mm.

General colour dark black-brown, abdomen darker than the head and prothorax. All femora brown, the intermediate and posterior pairs light yellowish-white basally, and lighter at extreme base; all tibiæ yellow, tarsi also yellow with a dark patch on second joint. Antennæ with first two joints dark brown; second lighter apically; 3 yellow, lightly tinged with brown near apex; 4 yellow, apical fourth brown; 5 brown, with basal half yellow (6 to 8 broken off in type-specimen, 7 and 8 at least presumably totally brown).

Head 1·8 times as long as broad across eyes, 2·8 times as long as the prothorax, but only very slightly (0·08) longer than the tube. Cheeks very slightly incurved behind eyes and thence gently arcuate to base; a few minute genal spines. Vertex slightly produced beyond eyes, with a pair of rather long bristles, which do not reach to apex of first antennal joint. Eyes small, occupying laterally 0·2 the length of the head, finely facetted; ocelli minute. Mouth-cone reaching across prosternum, rounded at tip. Antennæ about twice as long as the head (first 5 joints=1·5 times the length of head); relative lengths of joints 1 to 5:— 7 : 10 : 30 : 24 : 21.

Prothorax transverse, twice as broad as long; all setæ present, slightly knobbed, those at hind angles longest, almost 0·5 as long as the prothorax. Pterothorax a little broader than long, wings absent. First pair of legs rather short and somewhat stout; simple. Intermediate also short and somewhat stout; hind pair longer and more slender, femur 1·5 times the length of intermediate femur, broadest at distal third; tibia correspondingly long.

Side of abdomen gently arched to sixth segment, which is armed with a pair of short and comparatively stout, outwardly curved lateral processes and reaching slightly beyond the apex of segment; 7 evenly narrowing apically; 8 about as broad across apex as across base, with a pair of mid-lateral tubercles faintly suggested.



Siphonothrips brevis, sp. n., ♂.
1. Abdominal segments 6 to 8. 2. Tube.

Tube broadest at basal fourth, thence sharply narrowed, and continued to basal fifth or thereabouts, with the sides practically parallel, basal fifth sharply narrowed; viewed laterally the tube is sharply curved upwards at or about the basal third, so that the distal two-thirds is on a higher level than the base. Surface sparsely furnished with moderately short and very delicate hairs. Terminal bristles weak, only about one-third the length of the tube, light-coloured. Abdominal bristles also weak, those on 7 and 8 directed outwardly.

Type. In Hope Collections, University Museum, Oxford.

Hab. One male, coll. Prof. J. Sahlberg, Narenta.

Family **Phlœothripidæ.**

Liothrips micrurus, sp. n.

♀.—Uniformly dark brown, including fore-tibiæ, as in *L. major*, Buffa. Antennæ with second joint yellowish distally and 3–5 lemon-yellow, 4 and 5 deepening to brownish-yellow distally, 6–8 light brown, 6 yellowish distally. Wings clear.

Head a little more than 1·5 times as long as broad; cheeks not converging posteriorly; vertex raised in form of hump. Antennæ 1·5 times as long as head, inserted below vertex, approximate, joint 3 not as broad as 2 and 4; relative lengths:—16 : 18 : 31 : 31 : 24 : 23 : 17 : 9. Eyes occupying one-third the length of head; fore-ocellus on apex of raised vertex, directed forwards. Postocular bristles set well in towards mid-line, very short and weak. Mouth-cone long and pointed, reaching to base of prosternum.

Prothorax with anterior margin strongly emarginate, more than twice as broad across hind-angles as long through middle, but only 1·5 times as broad as long, taking the length from posterior margin to a line drawn across anterior angles. Mid-lateral setæ absent, others short, the postero-marginal ones about 0·4 the length of prothorax through middle, and those on anterior margins about 0·2 as long. Pterothorax 1·5 times as broad as the prothorax and a little longer than broad.

Abdomen no broader than pterothorax, gradually narrowing to segment 7 and thence a little more rapidly to tube. Tube very short, not one-half (0·47) the length of head and only 1·38 times as long as segment 9. Sides straight, evenly narrowed from base, where it is about 2·25 times as broad as at apex and more than 0·6 as broad as long. Bristles at tip and on segment 9 about 0·8 the length of tube, weak and colourless; two pairs of wing-retaining spines on each of the tergites 2 to 7.

Separated from *elongatus*, Bagn. (Neotropical), which has also a very short tube, by the coloration of the antennæ.

Type. In Hope Collections, University Museum, Oxford.

Hab. One ♀, Matarieh, near Cairo, from *Zyziphus*, 9. ix. 1911 (*F. C. Willcocks*).

The type-specimen is cleared in potash, so that it is possible to get but an approximate idea of the coloration; the colour of the antennæ is taken from a second example captured by Prof. Sahlberg at Heluan. This example, carded, showed a pronounced metallic purplish coloration, but I do not think it was natural.

Cryptothrips tenuipilosus, sp. n.

♀.—Length 2·4 mm., breadth of mesothorax 0·52.

Colour chestnut to dark grey-brown, apical half of tube lighter than base; fore-tibiæ yellow with inner and outer margins brown, fore-tarsi yellow. Antennæ brown, joint 3 yellow lightly tinged with brown distally; 4 light brown with basal third and tip yellow; 5 to 8 dark brown, 5 and 6 with basal fifth or thereabouts sharply yellow.

Head 1·23 times as long as broad just behind eyes, and 1·4 times as long as the prothorax; cheeks straight; evidently slightly diverging posteriorly, sparsely and minutely setose. Eyes finely facetted, occupying nearly 0·3 the length of head; space between them about three times the breadth of one of them. Ocelli large, posterior pair above a line drawn across middle of eyes and near their inner margins; anterior one forwardly directed. Postocular bristles long and very slender. Antennæ about 1 8 times as long as the head, relative lengths of joints 3 to 8 as follows:—24 : 25 : 24 : 19 : 18 : 14 — 3 and 4 equally broad and 5 about 0·2 narrower than either of them. Sense-cones short and stout, 2 (or more) on 3, 4 on 4, and 2 each on 5 and 6. Mouth-cone almost reaching across prosternum; basal joint of maxillary palpi longer than the distal joint.

Prothorax almost twice as broad as long; setæ very slender, those at anterior angles 0·4 and those at posterior angles 0·7 as long as the prothorax. Pterothorax large, 1·35 times as broad as prothorax and but slightly longer than broad. Fore and intermediate legs rather short, hind pair moderately long. Fore-femora slightly incrassate, tarsus unarmed. Wings reaching to about eighth abdominal segment, apparently slightly narrowed medianly; cilia dark.

Abdomen a little broader than pterothorax, gradually narrowing from segment 3 to 7, and thence more roundly and rapidly to base of tube. Tube 0·65 as long as the head, terminal hairs very slender, colourless distally, and about as long as the tube. Those on 9 exceptionally slender and also about as long as the tube; lateral bristles on 4–8 long, slender, colourless.

Type. In Hope Collections, University Museum, Oxford.

Hab. Corfu, 1 ♀ collected by Prof. J. Sahlberg, to whom I am indebted for a small but interesting collection, including the types of *Siphonothrips brevis* and the species here described.

Recognized by its short head, structure and coloration of antennæ, coloration of legs, and the unusually slender postocular, prothoracic, and terminal abdominal bristles.

Cryptothrips insularis, sp. n.

Length about 2·25, breadth of mesothorax 0·38 mm.

Near *C. dentipes*, Reut. Colour almost black; legs dark brown, tibiæ somewhat lighter apically; tarsi yellowish-brown. Antennæ concolorous with head, joint 3 yellow, dark brown near apex.

Form linear, apterous.

Head as in *dentipes*, about 1·25 times as long as broad behind eyes and about twice as long as the prothorax. Eyes small, occupying 0·25 the length of head, moderately finely facetted. Ocelli small, posterior pair widely separated and touching inner margins of eyes. Antennæ 1·75 times the length of head, intermediate joints not elongated as in *dentipes*, 3–5 approximately subequal and but slightly longer than 6.

Prothorax transverse, about 1·8 times as broad as long; two foveæ, one above the other, near each lateral margin. Pterothorax only a little broader than the width across fore-coxæ, transverse. Legs somewhat short.

Abdomen elongated, linear, a little broader than the pterothorax; segments 8–9 sharply narrowing to base of tube. Tube short, stout, 0·6 the length of head. Setæ indeterminable in the carded specimen.

Type. In the British Museum of Natural History.

Hab. Canary Isles (*T. V. Wollaston*).

The shape of the head is almost exactly as in *C. dentipes*, but not quite so broad. From this species it is readily separated by its linear form, the short antennæ (twice as long as the head in *dentipes*) and short intermediate joints, the darker fore-tibiæ, shorter legs, and the short tube, which in *dentipes* is as long as the head.

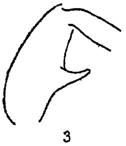
Genus MICROCANTHOTHRIPS, nov.

For some time I have been aware that my *Cephalothrips spinosus* could not be retained in that genus. A very strong artificial light enables one to examine the femora tucked up under the head through the dark chitin, and I have thus drawn up the following brief diagnosis, which is sufficient to characterise the genus for the time being. If further specimens do not come to hand, I propose to carefully remount the unique preparation.

It cannot be referred to any of the known genera with armed fore-femora, and would seem to come in the *Haplothrips* group.

Head only slightly longer than broad; eyes small; mouth-cone rounded and reaching almost across prosternum. Antennæ not quite twice as long as head, unusually massive; joint 7 constricted at base with a short stem, joined broadly to 8; 3 longer than any of the others. Fore-femur with a long sharp process at middle within; tibia stout; tarsal tooth small. Abdominal segments 4–7 at least with a stout spine-like seta (in addition to a long stout bristle) at each posterior angle and a short but similar postero-marginal spine within.

Fig. 3.



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Microcanthothrips spinosus (Bagnall). Outline of fore-femur.

Type. *Cephalothrips spinosus*, Bagn.

SYNONYMICAL NOTES.

Limothrips angulicornis, Jablonowski.

1894. *Limothrips angulicornis*, Jablonowski, Természetrajzi Füzetek. xvii., Budapest, pp. 44–47, pl. iii.

1912. *Limothrips setariæ*, Jones, Tech. Ser. 23, Bur. Ent., U.S. Dept. Agric. pp. 8–10, pl. iii.

When Mr. Jones described his *L. setariæ* I thought it would probably be the same as the species described by Dr. Jablonowski eighteen years previously from Armenia and Hungary, but it seems to be a rare species and I had not then seen examples. I have now before me several females and one male of a *Limothrips* collected by Dr. Anton Krausse, at Sorgono, Sardinia, in 1913, which agree in every detail with Jones's description and figures, though darker in colour, and which I have little doubt are referable to *Limothrips angulicornis*. Dr. Jablonowski does not figure the stout terminal spines, nor does his figure of the chætotaxy of the fore-wing agree, but we see exactly similar discrepancies in his figures of *Limothrips cerealium* (*op. cit.* xvii. 1894, pts. 3 & 4, pl. iv.) appearing in a later part of the same publication.

Dendrothrips ornatus (Jablonowski).

1894. *Thrips ornata*, Jablonowski, Termesz. Füzetek. xvii., Budapest, pp. 93–99, pl. iv.
1895. *Dendrothrips tiliæ*, Uzel, Monogr. der Ordnung Thysanoptera, pp. 160–162, pl. ii. fig. 15, and pl. vi. figs. 84–86.

Jablonowski's memoir was evidently issued whilst Uzel's work was in the press, and is not noticed in the latter author's bibliographical notes.

Baliothrips dispar, Haliday.

1911. *Bagnallia agnessæ*, Bagnall, Journ. Econ. Biol. vi. p. 7, and in later papers.

The maxillary palpus of *agnessæ* is undoubtedly 2-segmented, thus bringing the species into the genus *Baliothrips*, and I think there is no doubt that it should be referred to *B. dispar*, though my examples are much larger than described by Uzel. Having overlooked its generic position, this accounts for my previous inability to recognize this not uncommon species, *B. dispar*, in Britain.

I am indebted to Mr. Douglas Hood, who detected the synonymy in working out the North-American species, for bringing this to my notice.

Genus SCOLOTHRIPS, Hinds.

1902. *Scolothrips*, Hinds, Proc. U.S. National Mus. xxvi. p. 157.
1910. *Chætothrips*, Schille, Acad. Litt. Cracov. xlv. p. 5 (*separatim*).

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From the Annals and Magazine of Natural History,
Ser. 8. Vol. xiv., *November* 1914.

Brief Descriptions of new Thysanoptera.—IV. By Richard S. Bagnall, F.L.S., F.E.S. (Hope Department of Zoology, University Museum, Oxford).

Suborder Terebrantia.

Family Æolothripidæ.

Æolothrips gloriosus, sp. n.

♀.—Length about 1·1 mm.

General colour lemon-yellow. Abdominal segments 9 and 10 and tergite 8 entirely black; tergites 5 to 7 each with a blackish-brown bar almost covering the tergite, and signs of brownish markings on the anterior halves of other tergites. Eyes black. Head shaded with light greyish-brown, excepting the vertex and posterior corners, and pronotum with an indistinct marking down mid-line, expanding anteriorly and posteriorly and in centre of disc. Mesonotum and triangular disc of metanotum greyish-brown. Fore-wings lightly tinged with brown at base and with an irregular brown bar across second and fourth fifths; cilia brown. Antennal joints 1, 2, and basal half or thereabouts of 3 light lemon-yellow; rest black, the apical joints somewhat greyish black. Tips of tarsi with brown fleck.

Head rather long, quadrate, and not quite as long as the pronotum; basal joint of maxillary palpus much larger than the two apical joints together; mouth-cone large and long. Antennæ about 2·5 times as long as the head; joint 2 rather long; 3 pedicellate, cylindrical, and narrower than 2, 4, or 5; 4 distinctly angularly produced distally; 5 to 9 closely united, with 5 as long as 6 to 9 together. 3 1·5 times as long as 2, scarcely longer than 4; 5 to 9 together about 1·3 times the length of 6; elongate sense-areas on 3 and 4, the latter running into the produced part. Posterior ocelli almost touching margins of eyes.

Pronotum quadrate, without any long bristles, but with a basal-marginal series of minute black setæ.

Wings reaching to abdominal segment 6, typical of the genus; setæ minute, cross-veins distinct.

Abdomen with minute setæ, excepting the long bristles on 9 and 10, and a moderately conspicuous lateral pair on 8. Sutures of sternites 3–4, 4–5, 5–6, and 6–7 showing a dark transverse line; underside and sides otherwise (excepting apex) yellow.

Hab. Sorgono, Sardinia; 3 ♀s amongst a tube of Thysanoptera collected by Dr. A. H. Krausse, and kindly submitted to me by Dr. W. Horn of the German Entomological Museum.

Suborder TUBULIFERA.

Family **Hystricothripidæ.**

Genus HOLUROTHRIPS, nov.

Head broad, length to a line across anterior margins of eyes only a little longer than broad, but vertex narrowly produced beyond eyes for 0·75 the length of the head to base of produced part. Series of 4 stout knobbed spines at about middle of produced part. Posterior ocelli between eyes near anterior margins, anterior one near apex of produced vertex. Antennæ, excepting basal joint, very long and slender; longer than tube.

Abdomen broad, depressed, much as in *Hystricothrips*, Karny. Tube long and slender, about three times the length of *total* length of head and two-thirds the length of abdominal segments 1 to 9.

Differs from allied genera by the striking form of head and the extremely long slender antennæ.

Type. *Holurothrips ornatus*, m.

Holurothrips ornatus, sp. n.

Total length 4·6 mm.; length of tube 1·4 mm.

General colour dark blackish-brown; prothorax and distal part of mesothorax, anterior corners and margins of abdominal segment 2, and lateral margins of 3–7 yellowish-red, the lateral margins of 8 reddish-brown. Tube yellowish, greyish near base and shading to blackish-brown at distal third. Legs yellow, shaded lightly with brown in parts.

Surface of head striate or subreticulate; cheeks each with one seta near middle, and a shorter knobbed one on a small wart just behind eye. Eyes moderately finely facetted; stout knobbed bristle protecting each posterior ocellus. Basal antennal joint stout, brown; 2 smaller, light yellow—both with minute knobbed setæ; 3–8 yellowish, stems shaded with greyish-brown in parts. Relative lengths of joints approximately 5 : 4 : 37 : 21 : 18 : 11 : 7 : 7.

Pronotum strongly transverse, about 0·4 times as long as broad; setæ on warts, knobbed, a stout pair at anterior angles forwardly directed, those on posterior angles not quite so stout and mid-lateral pair smaller.

Pterothorax transverse, broadest near juncture with the abdomen. Legs much as in *Hystricothrips*. Wings slender, nearly reaching to the seventh abdominal segment.

Abdomen broadest near base and thence narrowing to base of tube, segment 8 only 0·35 as broad as 2. Tube very long and slender, sparsely and finely setose. Terminal hairs broken in the specimens at disposal. Lateral abdominal setæ rather short, stout, knobbed, and colourless; one at each posterior angle directed at right angles from the body.

Hab. Matang, Sarawak, at 1000 ft.; two examples in decaying leaves, 2. xii. 1913 (*G. E. Bryant*).

Leeuwenia indicus, sp. n.

Very near *Leeuwenia gladiatrix*, Karny, a little smaller and broader, with a more slender tube, which is about 1·2 times the length of the abdominal segments 1–9 together.

Uniform dark chestnut-brown, surface roughly reticulated. Antennal joint 2 lighter distally and 3–8 yellow, extreme tip brownish.

Antennæ a little longer than head and prothorax together; joints 3–6 clavate, 3 and 4 practically subequal; 5 shorter than 4; 6 shorter than 5; 7 and 8 broadly united, pointed apically and together about as long as 5.

Abdomen broader than in *gladiatrix*, with the dorsal and wing-retaining spines very poorly developed. Tube not so curved as in *gladiatrix* and only sparsely and somewhat minutely setose, with setæ more or less recumbent, the most distal third or fourth being almost destitute.

Separated from *gladiatrix* by its thin and more finely setose tube, which in that species is coarsely setose, with both long and short, stout, suberect setæ almost to the apex; also by the dark uniform coloration of the body and the poorly developed wing-retaining and dorsal abdominal spines.

The abdomen (excluding tube) is longer and not so stout in *gladiatrix*, and the tube therefore only about 0·6 the length of the segments 1–9 together. The surface of *indicus* is apparently more strongly reticulated and sculptured than in *gladiatrix*.

Hab. One specimen from the Indian Museum (no. $\frac{4297}{20}$), Moulmein, Lower Burma, 16. xi. 11 (*F. H. Gravely*).

Family Idolothripidæ.

Acanthinothrips annulipes, sp. n.

Length 8 to 9 mm.

Colour black, shining. Antennal joint 3 greyish-yellow, dark at extreme apex, with yellowish patch just before it; stem of 4 greyish-black. Distal half of fore-tibiæ yellow, with black ring just before apex, the intermediate tibiæ similar, but with ring near apex broader and not so sharply defined basally; hind-femora with a yellowish-white ring (in one specimen reddish) at about middle. All tarsi yellowish, dark apically. Wings grey—mid-ribs and cilia dark brown.

Head about 2·7 times as long as broad near base, cheeks slightly narrowed between eyes and base, and furnished with a few slender setæ. Vertex slightly produced beyond eyes. Posterior ocelli on a line drawn through anterior third of eyes, the anterior one near apex of produced part. Antennæ extraordinarily slender (excepting the two basal joints), about 3·7 times the length of the head; relative lengths of joints approximately 7 : 6 : 71 : 42 : 33 : 24 : 11 : 9. Post-ocular bristles close together and set rather far back. Eyes finely facetted.

Pronotum about 0·42 the length of head; setæ weak and colourless.

All femora thickened distally and furnished with several stout and rather long yellow bristles, somewhat as in *Anactinothrips*. Wings reaching to the sixth abdominal segment.

Abdomen long, segments somewhat as in *Actinothrips longicornis*, apical angles of the hindmost segments, at least, each with a short, stout, yellowish-brown spine, and the ninth with an additional pair on each side of the mid-line.

Tube about twice as long as the head, surface coriaceous;

sparsely setose; terminal hairs short, yellowish. Abdominal hairs moderately short, weak, and colourless.

A very distinct species.

Hab. Matang, Sarawak; 1 on dead bark, 1000 ft., 13. xii. 13; 2 on the wing, 2000 ft., 24. xii. 13; 1 Sungei China, Fort of Matang, Sarawak, by beating dead leaves, 14. xii. 13 (*G. E. Bryant*).

Anactinothrips distinguendus, sp. n.

♂.—Length 7·5 mm.

Colour chestnut-brown, tube darker near base and yellowish distally. Antennæ with second joint yellowish distally, 3 with stem yellowish, lightly shaded with brown about middle and apex brown; 4 with stem yellowish, shaded near middle, and 5 lighter basally. Wings greyish-yellow, cilia tinged with brown.

Head twice as long as prothorax and twice as long as broad near base, shaped as in *A. meinerti*, Bagn., but shorter and broader. The pair of dorsal bristles set at about the basal third, only one-half the length of the postocular bristles, weak; anteocular pair short, pointed, reaching to beyond the middle of the first antennal joint. Eyes finely facetted, occupying laterally about 0·22 the total length of the head. Ocelli moderately large, equidistant, the posterior pair close to inner margins of eyes and on a line through their middle.

Antennæ almost as in *A. meinerti*, but with the fifth joint about four-fifths the length of the fourth (instead of one-half the length in *A. meinerti*); approximate lengths of joints:—14 : 12 : 84 : 50 : 40 : 22 : 15 : 12. Sense-cones very short and slender, scarcely distinguishable.

Prothorax as in *A. meinerti*, the postero-marginal bristles broken off in the single preparation, but presumably long; pair at anterior angles short and curved, and the mid-lateral pair long and strong, about 0·65 the median length of pronotum. Maxillary palpi with the second joint three times as long as the basal.

Pterothorax 0·4 broader than the prothorax, transverse. Wings and legs much as in *A. meinerti*.

Abdomen evenly narrowing to tube, with each of the segments 3 to 7 slightly and roundly produced into a prominence for the seating of bristles, which latter are evidently (from the few that are preserved) not particularly long or strong.

Tube about 0·8 the length of the head, a little more than twice the length of the ninth segment, not three times as long as broad at base, and twice as broad at base as at apex.

Hab. BRITISH GUIANA, Bartica; 1 ♂ collected by Mr. G. E. Bodkin, with *Dicaiothrips brevicornis*, Bagn., and *D. lævicollis*, Bagn., from the leaves of the mangoe-tree, June 15th, 1913.

The unique example is, unfortunately, imperfect, and has been cleared in caustic potash and mounted in balsam. It is only the second described species of *Anactinothrips*, and is readily separated from *A. meinerti*, Bagn., by the short and relatively broad head and tube, the relative lengths of the antennal joints, and the short dorsal cephalic bristles as compared to the postocular pair. The second joint of the maxillary palpi is only *twice* the length of the basal in *A. meinerti*.

Phoxothrips breviceps, sp. n.

♀.—Length 2·7 mm. Form linear.

Dark chestnut-brown, head and abdomen almost black. Fore-tibiæ and all tarsi yellow. Third antennal joint yellow, shaded brown basally and distally; basal half of 4 and base of 5 yellow. Head only 2·25 times as long as broad at widest, namely at about the posterior fifth, where it is as wide as across eyes. Produced vertex with sides parallel; 0·25 the total length of head. Eyes laterally occupying about 0·23 the total length of head.

Antennæ at least 1·25 times the length of the head; relative lengths of joints:—3 : 5 : 11 : 9 : 7 : 6 : 4 : 4—3 to 5 clavate as in *P. pugilator*.

Prothorax about 0·35 the length of head, and 1·4 times as broad as long; broadest through middle, where it is 1·25 times as broad as the head. A somewhat slender seta at each hind angle.

Pterothorax 1·25 times as wide as the prothorax, longer than broad. Legs somewhat long, especially the hind pair; fore-femora not incrassate (or armed) in the ♀, and tarsus without tooth. Wings reaching to segment 7.

Abdomen not broader than the pterothorax, narrowing from segment 7 to base of tube. Tube about 0·6 the length of head, and twice as broad at base as at apex; terminal hairs not quite as long as the tube. Abdominal hairs slender and colourless, those on ninth segment longer than tube.

Easily separated from *P. pugilator*, Karny, by its much smaller size, the relatively short head, the longer second antennal joint, &c.

Hab. Simla, W. Himalayas, at 7000 ft., 7. v. 1910. Coll. Dr. N. Annandale. One specimen in the Indian Museum, 4300/20.

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Ser. 8, Vol. xv., *March* 1915.

Brief Descriptions of new Thysanoptera.—V.

By Richard S. Bagnall, F.L.S., F.E.S.

Suborder TEREBRANTIA.

Family Æolothripidæ.

Subfamily *Melanothripinæ.*

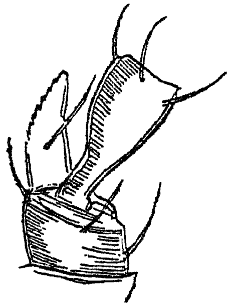
Melanothrips fuscus (Sulzer).

Tunis: Tunis, 56 ♀♀ and 2 ♂♂, Feb. 7th, and 1 ♀, Feb. 20th, 1903; Sousa, 2 ♀♀ and 1 ♂, Feb. 28th, 1903 (*Biro*). In the National Hungarian Museum.

Genus Cranothrips, nov.

Apex of the first antennal segment strongly produced inwardly, with the inner edge of the produced part serrate.

Fig. 1.



Cranothrips poultoni. First and second joints of right antenna.

Head broader than long; a long stout genal spine behind each eye and inter-ocellar and postocular bristles present.

Fore-wings with cross-veins.

Type. *Cranothrips poultoni*, m.

The genus comes very near *Ankothrips*, and is easily recognized by the structure of the first antennal joint and the simple second joint.

Cranothrips poultoni, sp. n.

♀.—Length 1·65, breadth of mesothorax 0·25 mm.

Colour grey-brown; fore-legs yellow-brown; antennæ with the produced part of first joint clear yellow, joint 3 yellow tinged with grey, and 4 yellowish-brown. Fore-wings light grey-brown, with the first and third fourths white.

Head broader than long, broadest near base. Eyes large, somewhat coarsely facetted, pilose, occupying at least 0·5 the length of the head. A long stout genal spine behind each eye; inter-ocellar and postocular spines rather long. Mouth-cone reaching across prosternum; maxillary palpi long, apical joint shorter and narrower than either joints 1 or 2. Antennæ more than twice as long as head, first joint with the characteristic prolongation described in the generic diagnosis, which almost reaches the apex of the second joint. Relative lengths of joints 3–9 as follows:—19 : 17 : 16 : 15 : 9 : 6 : 8.

Prothorax about as long as the head and 1·75 times as broad as long; furnished with several stout setæ, of which the mid-lateral pair, two at each hind angle, and certain of the postero-marginal series are the longest.

Legs typical of the family; femora and tibiæ sparingly setose. Pterothorax large, 1·25 times longer than broad, sides rounded, giving an oviform appearance.

Wings broad, reaching to the seventh abdominal segment. Fore-wings broadest near middle, where they are nearly 0·2 (one-fifth) as broad as long; both longitudinal veins set with, roughly, 20–22 longish black spines, and costa with about 36. Cilia on lower edge wavy.

Abdomen elongate-ovate, tenth segment shorter than ninth, setæ on 9 and 10 about as long as segment 9.

Hab. Western Australia, near Fremantle, on flowers (nos. 17 and 22). The only named flower is a proteaceous shrub (*Dryandra floribunda*, R. Br.), and it is impossible to say whether this species is attached to *Dryandra* (or any other flower) or is a general species.

I find particular pleasure in naming the species after Prof. E. B. Poulton, F.R.S., who obtained several other interesting species on the occasion of the recent British Association visit to Australia, and who has encouraged my researches in many directions.

Subfamily *ÆOLOTHRIPINÆ.*

Æolothrips fasciatus (L.).

TUNIS: numerous specimens collected by Mr. Biro in 1903, as follows:—Tunis, 5 ♀♀ and 1 ♂, Feb. 7th, and 4 ♀♀, Feb. 26th; Sousse, 1 ♂ and 1 ♀, March 28th; Gafsa, 26 ♀♀ and 5 ♂♂, March 24th, and Gafsa Oasis, 1 ♀, March 25th. National Hungarian Museum.

CANARY ISLANDS: Las Palmas, Grand Canary, 1 ♀ on *Sisymbrium officinale*, June 28, 1914 (*Prof. E. B. Poulton*).

Æolothrips brevicornis, sp. n.

♀.—Length 1·25 mm.

Reddish- to chestnut-brown; fore-legs and third antennal joint yellowish-brown.

This species comes in the "*fasciatus*" group with banded wings, and differs from all the species excepting *fasciatus* in having the abdomen unicolorous. Apart from its small size, *brevicornis* may be separated from *fasciatus* by its shorter antennæ, which are approximately 2·2 times (instead of about 3 times, in *fasciatus*) the length of the head. The intermediate antennal joints are relatively shorter compared with their breadth; joints 3 and 4 are practically subequal, whereas in *fasciatus* joint 3 is 1·2 times the length of 4. In the species of the "*fasciatus*" group in which the base of the abdomen is banded with white the last four (6 to 9) antennal joints are together much longer than the fifth; in *fasciatus* they are practically equal to the fifth (20 : 19), whilst in *brevicornis* they are much shorter than the fifth (19 : 14).

Hab. SOUTH AFRICA: Cape Town, 1 ♀ shaken from a flower, July 13th, 1914 (*Prof. E. B. Poulton*).

Family **Thripidæ.**

Heliothrips femoralis, Reut.

GERMAN EAST AFRICA: Arusha, 1 ♀ in the collection made by Mr. C. Katona in October and November 1905. National Hungarian Museum.

The species is generally regarded as a hothouse one, but I also have an example taken with *H. hæmorrhoidalis* on banana-palm, Spain.

Heliothrips brunneipennis, sp. n.

Length about 1·5 mm., linear.

Colour dark brown; head yellowish-brown and abdomen apically lighter. Fore-femora and tibia yellow, lightly tinged with brown; intermediate and hind femora and tibiæ dark brown, basally yellow, the tibiæ also yellowish-white distally; all tarsi whitish-yellow. Fore-wings brown, darkest at base, a light patch in about the third tenth; hind wings light greyish-brown, with median vein darker; cilia dark. Antennæ with basal joint yellowish; 2 brown, 3 to 5 clear lemon-yellow, 6 brown, and style yellowish-white.

Head more than 1·8 times as broad at broadest (near base) as long. Cheeks swollen behind eyes, subparallel to a collar-like thickening before constriction at base, which runs in an arc close to the hind margin of the eyes; reticulations behind collar larger, but not so strong. Eyes large, coarsely facetted, and weakly setose. Ocelli large, posterior pair on a line through middle of eyes. Maxillary palpi 2-segmented. Antennæ at least twice as long as the head, lengths of joints 3 to 8 relatively 26 : 26 : 18 : 10 : 3 : 10,—3 and 4 spindle-shaped, 5 claviform, and 6 globular; style bristle-like. Forked trichomes on 3 and 4 curved, exceptionally long and slender, one of the arms on 4 being 1·7 times the length of that joint.

Prothorax broader than long, posterior margin from about centre of lateral margins arcuate. Pterothorax large and broad, and about as long as broad. Wings reaching to middle of abdominal segment 8. Fore-wing about 15 times as long as broad through middle, not upcurved distally. Setæ rather short and slender, dark; costa with 25/26, increasing in length towards apex of wing; upper vein with 4 near fork and 2 near apex, and lower vein with 1+2+1+1+1, the last situated towards the end of the fourth fifth—that is, before the first of the two distal bristles of the upper vein.

Abdomen elongate-ovate, occupying about 0·6 the total length of insect, not broader than the pterothorax. Segments 8 to 10 evenly narrowed to tip; 9 about 1·8 times as long as 10; bristles on 8–10 moderately long, pale.

Hab. Ceylon, Peradeniya, feeding on the leaves of *Litsea chinensis* (*A. Rutherford*, no. 3648, Ent. Research Comm. no. 60).

Dinurothrips rutherfordi, sp. n.

♀.—Length about 1·1 mm.

Dorsal surface deeply reticulated.

Yellow, shaded with reddish- to chestnut-brown, deepest towards sides of head, thorax, and abdomen. Fore-tibiæ yellow, femora brownish; intermediate femora and tibiæ brown, yellowish distally; hind-femora greyish-brown, tibiæ yellow. Antennæ much as in *D. hookeri*, Hood, yellow, second joint deeper in shade, greyish-brown apically. Fore-wings greyish, yellow in line of veins, with an indistinct brownish band near base and across the seventh eighth, and other scarcely defined bands; setæ stout, dark brown basally to yellow (in some) at points; hind-wing with brown median vein.

Head about twice as wide across eyes as long, longer than the prothorax. Cheeks roundly narrowed posteriorly and constricted abruptly at base; explanate, the shelf-like margins projecting somewhat distally in the curve of the outer posterior margin of the eye. Eyes prominent, occupying about 0·5 the length of the head, coarsely facetted and not pilose; space between them almost twice the width of the eye. Ocelli and antennæ almost as in *D. hookeri*. Vertex also with shelf-like margin. Maxillary palpi apparently 2-jointed.

Prothorax with broad, wing-like, explanate, lateral margins, anteriorly wider and more broadly rounded than posteriorly. Pronotum proper transverse, not as broad as the head, with a series of lateral and antero-marginal setæ in pairs, and a pair of pre-basal ones, one on each side of the median line.

Pterothorax massive, twice as broad as the pronotum proper (*i. e.* excluding the explanate margins); metanotum narrower than the mesonotum, the latter sharply narrowed to juncture with abdomen, which is waist-like. Wings reaching to abdominal segment 8, slender and linear; fore-wings not upwardly curved distally, veins running close to margins; setæ on costa stout and widely spaced, only 8 or 9; those on veins both longer and stouter; upper vein with 2 near base, 1+1 in second fourth and 1+1+1 in distal third; lower vein with 8 setæ, 2 near base and then 1+1+3+1. Top fringe somewhat sparse, lower long and wavy.

Abdomen elongate, slightly broader than the pterothorax; surface of each segment anteriorly and laterally deeply reticulated; ninth partially received into eighth; tenth cylindrical, divided dorsally, about 0·7 the length of head and 0·5 the length of segment 9. Bristles on 9 only about 0·7 the length of 10; a stoutish bristle on each side of the longitudinal division of segment 10 near apex, 0·8 the length of the segment.

Larvæ yellow; head, pronotal plates, and last two abdominal segments dark greyish-brown; legs dirty greyish-yellow to brown.

Type. British Museum of Natural History.

Hab. Ceylon, Peradeniya, on leaves of *Allamanda*, 20. 2. 14, *A. Rutherford* (A. R. no. 3673, Ent. Res. Comm. no. 61), also 27. 3. 14 (no. 83).

This species differs from the type of the genus, *D. hookeri*, Hood, in the explanate lateral margins of head, the broader and complete wing-like lateral explanations of prothorax, the series of pronotal setæ, and the abnormally strong spines of the fore-wing, which in *hookeri* are few and inconspicuous. The forms and lengths of abdominal segments 9 and 10 in the two species also differ markedly.

Genus RHIPIPHOROTHRIPS, Morgan.

Rhipiphorothrips, Morgan, Proc. U.S. Museum, vol. xlvi. p. 17 (August 23, 1913).

Retithrips, Bagnall (nec Marchal), Ann. & Mag. Nat. Hist. ser. 8, vol. xii. (Sept. 1, 1913).

A comparison between *Rhipiphorothrips pulchellus*, Morgan, from Banyan, Philippine Islands, and my *R. bicolor* from Vine, Ceylon, described within a few days of each other, will be interesting. If not one and the same species, they are at least very closely related.

Suborder TUBULIFERA.

Family **Ecacanthothripidæ**.

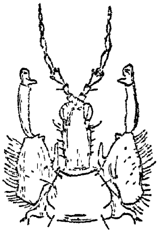
Ecacanthothrips bryanti, sp. n.

♂.—Very like *sanguineus* and *steinskyi*, all tibiæ and tarsi yellow in one specimen, in another hind and intermediate tibiæ brownish. Coloration of antennæ as in *sanguineus*. Postocular bristles present, and also a somewhat similar subgenal bristle behind each eye. Fore-femur with basal tooth long and strong, reddish distally; sparingly setose, the outer margin with a fringe of several longer and shorter hairs.

Antennæ with joints 4–8 longish and slender; 3 brownish, 4 and 5 brownish, yellowish near base.

Setæ at fore-angles of prothorax long and strong. Abdominal setæ long and strong, colourless; those on segment 9 longer than the tube. Tube little more than 0·5 the length of the head.

Fig. 2.



Ecacanthothrips bryanti, sp. n. Head, antennæ, prothorax, and fore-legs.

Easily recognized by the long hairs on the fore-femora. Also separated from *steinskyi* by the coloration of the antennæ.

Hab. 2 ♂s, Mt. Matang, W. Sarawak, one from dead tree 17. xii. 13 and the other 17. i. 14. Collected by Mr. G. E. Bryant, to whom I am indebted for some very interesting material, and after whom I find pleasure in naming the species.

Ecacanthothrips sanguineus (Bagnall).

CEYLON, on and under the bark of trees. Respectively met with by both Mr. Green and Mr. Rutherford.

Ecacanthothrips steinskyi (Schmutz), 1913.

Ormothrips steinskyi, Schmutz.

CEYLON, Peradeniya, ♂ and ♀, from bark of tree, 25. v. 13 (*A. Rutherford*).

Ormothrips inermis, Buffa.

BORNEO, 1 ♂, Mt. Matang, W. Sarawak, xii./13 (*G. E. Bryant*).

Family **Phlœothripidæ**.

Docessissophothrips laticeps, sp. n.

♂.—Length 3·0 mm.

Apterous.

Colour dark reddish-brown; fore-tibiæ and all tarsi yellowish.

Head much as in *D. ampliceps*, Bagn., smooth and shining, about 1·25 times as long as broad, and viewed laterally only weakly arched compared with *ampliceps* and other species of the genus. Eyes small and finely facetted, occupying about 0·2 length of head; ocelli small and widely spaced, a long bristle behind each posterior ocellus; two pairs of long postocular bristles, the outer pair being the longer. Genal spinelets few.

Antennæ black, about twice the length of head, joints 2–4 yellowish, 3 grey-brown at apex, and 4 shading to brown apically; 3–5 clavate.

Prothorax strongly transverse, about 2·5 as broad as long and 0·4 the length of head, all setæ long, at least those on hind margin as long as the prothorax. Pterothorax transverse. Legs long, fore-femora not very stout, with long setæ at outer edge near middle, all tibiæ with long setæ near knee, fore-tarsus with tooth. Abdomen broad, with segments strongly transverse, laterally with reddish patches as far as segment 7; 8 rounded sharply to 9, 9 only slightly narrowed. Tube long and stout basally, 1·22 times the length of head, narrowed to distal half, with a weak constriction before apex; surface smooth, but with a scale-like sculpturing, almost aciculate; apical hairs rather short, dark, only about 0·35 the length of the tube, those on 9 about 0·7 as long as the tube, those on 6 and 7 longer than on 9, and on 8 shorter.

Of the described species, *D. ampliceps*, Bagn. (Central America), *D. monstrosus*, Bagn. (New Caledonia), *D. major*, Bagn. (no data), and *D. frontalis*, Bagn. (Japan), this species can only be compared with *ampliceps*, and is separated by its broader and (viewed laterally) less strongly arched head, the three pairs of long cephalic bristles, the longer setæ on fore-margin of prothorax, etc. It is the least extreme species of the genus, whilst *monstrosus* is the most extreme. Only a single example is known of each of these striking species, which would seem to suggest extreme rarity or, perhaps, specialized habitat; the fact that Mr. Bryant found the specimen under review with termites would seem to strengthen the latter suggestion.

Hab. 1 ♂, Mt. Matang, W. Sarawak, 28. i. 14, under bark with termites (*G. E. Bryant*).

Hindsiania apicalis, sp. n.

♀.—Length 1·7 mm.

Colour yellow to light yellowish-brown; abdominal segments 8 to 10 dark chestnut-brown; head, intermediate and hind tibiæ brown. Antennal joints 1, 2, 7, and 8 brown, 2 sometimes yellowish distally, 3 to 5 clear yellow, 6 tinged with brown. Fore-femora and tibiæ yellow, tinged to greyish-brown at outer margins; intermediate and hind femora yellow.

Head only about 1·15 times as long as broad; cheeks practically subparallel, almost imperceptibly curved. Mouth-cone not reaching across prosternum, apex almost truncate. Eyes occupying about 0·3 the total length of head; post-ocular bristles neither strong or long, blunt. Ocelli moderately large, posterior pair near to the interior margins of eyes. Antennæ about 1·8 times as long as head; relative lengths of segments approximately 6 : 11 : 12 : 14 : 13 : 11 : 11 : 8; 3 obconical, 4 broader than 3 or 5, 7 and 8 broadly united.

Pronotum transverse, about 0·75 the length of head; setæ blunt, those at posterior angles about 0·2 the length of pronotum and pair at angles still shorter and weaker; mid-lateral pair apparently obsolete. Pterothorax practically square, as broad as width across fore-coxæ. Legs not long, moderately stout; fore-tarsus with a small pointed tooth.

Abdomen occupying about 0·65 the total length of insect, broader at middle than the pterothorax; elongate, about four times as long as broad across segments 3 to 6, and narrowed sharply from base of 8 to apex.

Tube about 0·55 the length of head, 0·65 as broad at base as long, where it is 2·4 times as broad as at extreme apex; sharply narrowed and rather constricted near apex. Terminal hairs a little longer than tube; abdominal hairs moderately long and slender, blunt or faintly knobbed, colourless.

The coloration of the hind and intermediate tibiæ is a curious feature, the femora and tarsi being yellow and the tibiæ brown.

Hab. INDIA, Almora, Kumaon, 5500 ft., several swept from jungle plant, 4. vii. 11 (*O. Paiva*, no. 4295/20).

Liothrips micrurus, Bagnall.

Ann. & Mag. Nat. Hist. ser. 8, vol. xiii. p. 292 (March 1914).

This species is apparently attached to *Zyziphus spini-christi*, and was described from a specimen obtained by Mr. F. C. Willcocks at Matarieh, near Cairo. Mr. Willcocks has found other specimens on the same tree from Ezbet-el-Nakhl, February, and at Gizeh, near Cairo, March 1911. Evidently rare.

In describing it I stated that a carded specimen captured by Prof. Sahlberg of Helsingfors at Heluan exhibited a pronounced metallic-purplish coloration.

Mr. Willcocks has furnished me with the following live-colour notes of the species—the first known thrips to exhibit metallic coloration of any kind :—

Head, thorax, and abdomen deep metallic violet—in some lights appears jet-black ; hairs on abdomen pale. Eyes very dark brown. Antennæ: two basal joints dark, others pale yellowish-brown. Wings silvery, with pale brownish fringe. Legs deep metallic violet.

Genus ALEURODOTHRIPS, Franklin, 1909.

Chromatothrips, Schmutz (type *C. fasciata*, Schmutz), K. Akad. Wiss. Wien., Mathem.-Naturw. Kl. cxxii., July 1913, p. 1043.

I consider that the type-species of *Chromatothrips* is closely related to *Aleurodothrips fasciatipennis*, Franklin, and congeneric with it.

Aleurodothrips fasciapennis (Franklin).

Ceylon, Peradeniya, 1 ♂ taken by Mr. A. Rutherford among *Aspidiotus lataniæ*, 27. vi. 1913.

The only difference I can detect in this example and specimens from Florida lies in the coloration of the antennæ, the former having the sixth joint entirely grey-brown. *A. fasciatus* closely resembles this species, but is easily distinguished by the coloration of the body, antennæ, and legs.

Androthrips flavipes, Schmutz.

Androthrips flavipes, Schmutz, *l. c.* cxxii. p. 1031 (July 1913); Bagnall, Ann. & Mag. Nat. Hist. ser. 8, vol. xiii. p. 27 (Jan. 1914).

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From the ANNALS AND MAGAZINE OF NATURAL HISTORY,
Ser. 8, Vol. xv., *June* 1915.

Brief Descriptions of new Thysanoptera.—VI.

By RICHARD S. BAGNALL, F.L.S.

Suborder TEREBRANTIA.

Family **Thripidæ.**

Genus HOMOTHRIPS, nov.

Head transverse, cheeks diverging posteriorly. Antennæ of usual Thripid type, but having a 3-jointed style which is not quite so long as the sixth joint. Mouth-cone constricted near middle, reaching across prosternum; maxillary palpi long, 3-jointed, the middle joint the shortest. A pair of very long fine inter-ocellar bristles, and four immediately behind antennæ between eyes. Prothorax transverse, with two long bristles at each hind angle. Fore-legs simple. Wings well-developed; fore-wings with both veins regularly set with setæ. Abdomen elongate; last two segments normal, and bristles on them long.

Type. *Homothrips distinctus*, mihi.

This genus differs from all genera excepting *Rhampothrips*, Karny, in the 3-jointed antennal style. From the latter it may at once be separated by the simple fore-tibiæ and tarsi and the regularly set upper-vein of fore-wing.

Homothrips distinctus, sp. n.

♀.—Length 1·4 mm.

General colour yellow; legs, basal antennal joints, and abdomen lighter, almost white; tip of abdomen and disc (at least) of tergites 2–8 slightly tinged with brown; mesothorax near juncture with prothorax, the disc of pronotum and the head (excepting a patch at hind corners, from the eye broadening posteriorly) brown. Antennæ approximate, joints 3–5 weakly claviform, 6 constricted at base and broadly united to style; relative length of joints 3 to 9 approximately 15 : 14 : 11 : 13 : 3 : 3 : 5. Forked trichomes on 3 and 4. Eyes very largely facetted, and minutely and sparsely pilose. Ocelli set well back.

Prothorax about as long as head and about 1·6 times as broad as long, surface sparsely setose. Bristles at posterior angles about 0·75 the length of the prothorax. Pterothorax longer than broad and broader than the prothorax. Legs usual, rather stout; hind-tibiæ with a double row of setæ inside for the distal two-thirds of its length. Wings reaching to abdominal segment 8; setæ of fore-wing long; costa, upper vein, and lower vein furnished with 25, 22 (5 and 17), and 15 respectively; lower cilia long. Abdomen long and linear; segment 9 sharply narrowed to base of 10, and bristles on these segments strong and considerably longer than the segment bearing them; 9 furnished with a latero-dorsal pair in addition to the series at apex.

Hab. SOUTH AFRICA, from flowers of "sugar-bush" (Proteaciæ), gathered at Cape Town, July 13th, 1914 (*Professor E. B. Poulton*).

A. PHYSOTHRIPS group.

Genus MEGALUROTHRIPS, nov.

Allied to *Physothrips*. Head with a long and strong pair of inter-ocellar bristles, maxillary palps . . . . . . Bristles on prothorax . . . . . . Mesonotum with a long bristle somewhat remote from each shoulder. Both veins of fore-wing regularly set with setæ. Abdominal segments 9 and 10 abnormally large, together longer than the length of head and prothorax, sharply obconical.

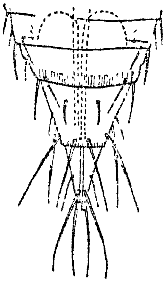
Megalurothrips typicus, mihi.

Megalurothrips typicus, sp. n.

♀.—Length about 1·4 mm.

General colour dark brown ; fore-tibiæ yellowish distally, and all tarsi yellowish. Antennal joints 3 and 4 yellow, the latter shaded brown distally, and 5–8 light brown, with 5 yellowish at base. Fore-wings light yellowish-brown, with a light patch near base and another near tip. Head transverse, 1·4 times as wide as long ; eyes coarsely facetted, pilose. A series of minute dorsal setæ on a line behind eyes. Ocelli rather large, the hind pair well separated and the posterior one forwardly directed and protected by a pair of very long inter-ocellar bristles which are as long as the two basal antennal joints together. Antennæ about 2·6 times the length of the head, joint 3 *apparently* shorter than 4 ; 5 distinctly shorter than 3, 4, or 6 ; the style about 0·5 the length of 6, with the apical joint longer than 7. Trichomes and bristles long.

Fig. 1.



Megalurothrips typicus, gen. et sp. n. End of abdomen, ♀. Dotted line showing ovipositor and sheath.

Prothorax 1·4 times as long as the head. It is impossible to say from the imperfect specimen if there is one or two long bristles at each hind angle. Legs rather stout. Pterothorax about as long as broad, large. Wings reaching to the ninth abdominal segment ; costa, upper and lower veins of fore-wings furnished with approximately 22, 17 (3 + 14), and 15 longish setæ respectively. Abdomen (excluding segments 9 and 10) elongate-ovate, 9 and 10 subequal in length and distinctly longer than any of the preceding segments and sharply obconical ; 10 open above.

A pair of straight lateral bristles on 8 reaching beyond the middle of 9, and 9 and 10 furnished with long bristles, longer than the segments bearing them, and those on 9 overreaching the tip of 10.

Hab. W. SARAWAK, Mt. Matang; 1 ♀ caught on the wing, December 1913 (*G. E. Bryant*).

Tæniothrips seticollis, sp. n.

♀.—Length 1·3 mm.

Dark grey-brown, thorax yellowish in part, head darker than the prothorax. Antennæ with joint 1 yellowish-brown, 2 lighter, 3 yellow, 4 to 8 greyish-brown, with 4 lighter basally. All femora yellowish to grey-brown; tibiæ yellow, lightly shaded to grey or grey-brown; tarsi yellowish. Fore-wings light greyish-brown, basal fourth white.

Head nearly as long as broad, cheeks swollen and eyes prominent; surface transversely striate. Eyes coarsely facetted, pilose. Ocelli on a prominence, large, posterior pair placed close to inner margin of eyes and well back, anterior one forwardly directed.

Antennæ at least twice as long as head; joints 3 and 4 fusiform, practically subequal; 5 about 0·85 the length of 4, and 6 practically as long as 4, the two-jointed style very short, only 0·3 the length of joint 6. Forked trichomes on 3 and 4.

Prothorax slightly longer than the head and about 0·8 as long as broad; the two long bristles at each hind angle slender and more than 0·5 the length of prothorax. Surface and side sparingly set with somewhat longish setæ, mostly curved and directed backwards. Fore-legs stouter than the others and (with hind and intermediate legs) also set with rather long curved setæ; the hind-tibiæ furnished for the length of the inner margin with a double row of straight setæ, terminating distally with a pair of stout yellow spines. Pterothorax more than twice as long as the pronotum and as broad across mesonotum as long. Wings long, reaching to the eighth abdominal segment. Fore-wings pointed distally; upper vein furnished with 19 and lower vein with 17 moderately long setæ. Setæ on costa 27, increasing in length towards apex of wing; upper fringe sparse, delicate; lower fringe wavy. Abdomen elongate-ovate, broader than the pterothorax and approximately 2·5 times as long as broad; segments 8 and 9 sharply narrowed to base of 10; 10 open above. Abdominal bristles light brown, those on 9 and 10 longer than the segments bearing them.

Hab. W. AUSTRALIA; 1 ♀ taken by Professor E. B. Poulton, F.R.S., with examples of *Isoneurothrips australis*, sp. n., from the flowers of a small tree of *Acacia* sp. (probably *A. baileyana*, F. v. Müll.), Mundaring Weir, Darling Range, Perth, August 3rd, 1914 (tube 16).

Differs from known species by the fore-vein of fore-wing, which is regularly set with setæ—a character generally regarded as of generic importance.

B. THRIPS group.

Genus ISONEUROTHRIPS, nov.

With all the characters of *Thrips* (+*Bagnallia*), but having the whole of the upper-vein of fore-wing regularly set with setæ as well as the lower.

Type. *Isoneurothrips australis*, mihi.

a. *Thrips* s. str. type.

Isoneurothrips australis, sp. n.

♀.—Length 1·4 mm.

General colour yellow, with dark setæ. Head only lightly tinged with grey, vertex brownish; pronotum yellowish-brown; pterothorax tawny, tinged with brown at margin. Abdomen yellow, segments 9–10 wholly dark grey-brown, other tergites light grey-brown and pleurites yellowish. Legs yellow, tinged with grey. Fore-wings greyish-yellow with setæ and cilia dark. Eyes black and ocelli with crimson hypodermal crescentic margins. Head transverse, about 0·7 as long as broad; cheeks arcuate. Eyes prominent, coarsely facetted, pilose. Some short, erect, genal setæ behind eyes and a dorsal series approximately on a line behind eyes.

Antennæ about three times as long as the head; first joint yellow, second grey-brown, third yellowish, irregularly tinged with grey-brown; fourth and fifth rich purple-grey, yellow basally, and 6 of the same rich colour in the basal two-thirds, but with the apical third together with the style light grey. Joints 3 and 4 fusiform, and together with 6 approximately subequal; 5 much smaller and style very short.

Prothorax longer than head, bordered anteriorly; the two prothoracic bristles at each hind angle about one-third the length of the pronotum, stout and almost black; a series of shorter postero-marginal setæ. Surface sparsely and minutely setose. Legs almost as in the previously described species, but with more minute setæ, and the series of setæ on inner side of hind tibiæ shorter and stouter and starting at about the middle. Pterothorax large, at least 1·6 times as broad as the prothorax and but slightly longer than broad; disc faintly reticulated. Wings reaching to eighth abdominal segment; setæ of fore-wing short, stout, and very dark. Costa, upper and lower vein furnished with approximately 38, 28 (3+7+18), and 23 setæ respectively, upper fringes sparse, lower wavy. Abdomen elongate, narrower than the pterothorax, with sides subparallel to segment 6, thence faintly narrowing to 8; 9 and 10 together obconical, and the latter open dorsally; bristles on 9 and 10 long.

A fine, richly coloured species.

Hab. W. AUSTRALIA; taken by Professor E. B. Poulton from the flowers of a small *Acacia*-tree (probably *A. baileyana*, F. v. Müll.). Mundaring Weir, Darling Range, Perth, Aug. 3rd, 1914 (tube 16), and from the flowers of *Acacia pulchella*, R. Br., Cottesloe Beach, near Fremantle, Aug. 31st, 1914 (tube 26).

b. *Bagnallia* type.

Isoneurothrips orientalis, sp. n.

♀.—Length approximately 1·4 mm.

Colour dark blackish-brown; fore-femora lighter brown, with tibiæ yellowish, shaded to brown at margins; intermediate tibiæ somewhat lighter distally. Antennal joint 3 yellowish-white, tinged with grey to a light brown, 4 greyish-white at base and 5 to 7 entirely brown. Head about 0·85 as long as broad, surface transversely striate; eyes moderately largely facetted, pilose. Ocelli large, placed well back, and posterior pair touching the inner margin of eyes. Antennæ 2·2 times as long as the head, joints 4 to 7 slender, 3 and 4 constricted near apex; approximate length and breadth of 3 to 7 as follows:—

$$\frac{18 : 19 : 14 : 18 : 5}{6 : 7 : 5 : 5 : 2}.$$

Prothorax quadrate, scarcely longer than the head; 1·5 times as broad as long. Setæ at hind angles long, 0·5 as long as the pronotum. Legs much as in *I. australis*. Wings grey-brown, setæ longer and more slender than in *I. australis*. Abdomen long and linear.

♂.—Smaller. Sternites 3 to 7 each with a strongly transverse area much as in *Baliothrips dispar*, the first two being the largest.

Hab. W. SARAWAK, Mt. Matang, at 1000 feet, December 20th, 1913; 2 ♀s and 1 ♂ in a white flower (*G. E. Bryant*).

Unfortunately imperfect.

Suborder TUBULIFERA.

Family **Phlœothripidæ.**

A. MACROTHRIPS group.

Adiaphorothrips antennatus, sp. n.

Length about 5·0 mm.

Very like *A. simplex*, Bagn.; head shorter and less than 1·5 times as long as broad, genal setæ and the inter-ocellar bristles distinctly longer and stronger than in *simplex*. Antennal joints 3 to 5 practically subequal, 3 being apparently shorter than 4 (approximately 21 : 23 : 22, instead of 29 : 26 : 21 in *simplex*). Male smaller, with the head comparatively longer, and the tube only about 1·15 times the length of the head as compared with 1·3 times the length in the female. A distinct wart at extreme apex of each fore-tibia within.

Hab. W. SARAWAK; 1 ♀, Mt. Matang, at 1000 feet, from under bark of dead tree, Dec. 7, 1913, and 1 ♂, Quop, March 28th, 1914 (*G. E. Bryant*). Mr. Bryant also collected examples of *A. simplex* from both localities.

B. TRICHOTHRIPS group.

Genus TETRACANTHOTHRIPS, nov.

Comes in *Trichothrips* group. Size small. Head broader than long, cheeks arcuate, narrowed to base, and armed with short strong spines. Mouth-cone . . . . Antennæ . . . .

Prothoracic setæ very long. Fore-coxæ with one long strong seta and a few shorter ones. Anterior margin of mesonotum armed on each side with two stout finger-like spines and other smaller ones. Tube normal in shape, but with distinct though somewhat weak longitudinal carinations basally.

The spine-like mesonotal processes are a peculiar feature.

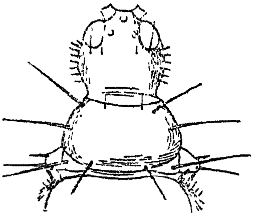
Type. *Tetracanthothrips borneensis*, m.

Tetracanthothrips borneensis, sp. n.

♂.—Length about 1·6 mm.

Dark brownish-black, shining; pterothorax medianly in form of an inverted triangle light yellowish-brown; head not so dark as prothorax; the two basal antennal joints (rest broken off in the unique specimen) yellow. Fore-legs yellow to yellowish-brown, with the femora shaded to brown basally; hind and intermediate legs darker, but yellowish above knees. Tube brownish at apex. Fore-legs incrassate; intermediate and hind-femora with some strong spines on the upper margin near or beyond middle. Bristle at each hind angle of prothorax longer than the length of the prothorax through middle. Wings short, vestigial. Abdomen broadly ovate; segments strongly transverse. Tube not quite so long as the head. Abdominal hairs long; those on segment 9 as long as tube, and on 6 and 7 longer; mostly dark, but some on 8 and 9 practically colourless.

Fig. 2.



Tetracanthrothrips borneensis, gen. et sp. n. Head, pronotum, fore-coxæ and front of mesonotum.

Hab. W. Sarawak; 1 brachypterous ♂, Mt. Matang, December 1913 (*G. E. Bryant*).

Allothrips caudatus, sp. n.

♂.—Forma *macroptera*.

Length about 2·3 mm.; breadth of pterothorax 0·45 mm.

Yellowish- to greyish-brown; head and pterothorax yellowish medianly. Abdomen dark grey to black-brown; tube reddish, shaded with brown at apex. Fore-legs yellowish, shaded to grey-brown; outer margin of femora darkest; hind and intermediate femora dark grey-brown; all tarsi yellow. Antennal joint 3 yellow, tinged with grey distally; 4 and 5 yellowish, shaded with grey-brown basally and distally; 6 yellowish basally. Head large, as broad as long and nearly twice the length of the prothorax; cheeks very slightly converging posteriorly. Eyes occupying dorsally about one-third the length of head, finely facetted; postocular bristles long, pointed. Ocelli large, placed well forward, the posterior one situated at the apex of raised vertex and forwardly directed. Mouth-cone short, broadly rounded, and reaching about 0·65 way across the prosternum; labial palps rather long. Antennæ about twice the length of the head, seven-jointed, joints 3 to 5 claviform and 3 and 4 practically subequal. Relative lengths and breadths of joints 3 to 5 :—

$$\frac{30 : 32 : 28 : 24 : 28}{13 : 14 : 12 : 11 : 10}.$$

Joint 6 constricted apically and truncate distally, and 7 elongate, oviform. Sense-cones long and slender.

Prothorax strongly transverse, more than 2·5 times as broad as long; all prothoracic setæ present, long and pointed, the postero-marginal pairs about 0·6 the length of prothorax. Fore-legs incrassate, tarsal tooth stout; single prominent seta on each coxa. Pterothorax scarcely broader than the breadth across fore-coxæ, about 0·875 as long as broad. Wings reaching to abdominal segment 8; cilia smoky brown. Abdomen slightly broader than pterothorax, elongate, with segments strongly transverse; segments 7 to 9 roundly narrowed to base of tube. Tube a little longer than the head, twice as broad at base as at apex; more sharply (and somewhat roundly narrowed) from about middle. Terminal hairs only about 0·4 the length of tube. Abdominal bristles yellowish, pointed, some on 7 to 9 long, the longest on 9 being about 0·8 the length of the tube.

Sharply separated from the only other described species, *A. megacephalus*, Hood, by its coloration, larger size, the longer antennal joints 3 to 7, the shorter pronotum and mouth-cone, the long tube, and nature of chætotaxy.

Hab. W. SARAWAK; 1 ♂, Mt. Matang, Dec. 11th, 1913 (*G. E. Bryant*).

Family **Ecacanthothripidæ**.

There are evidently several species of *Ecacanthothrips*, and all available material requires re-examination. *E. bryanti*, Bagn., *E. crassiceps*, Karny, *E. sanguineus* (Bagn.), and *E. steinskyi* (Schmutz), have already been described; but in Mr. Bryant's very interesting Bornean material is a series of *Ecacanthothrips* characterized by the simple fore-coxæ of the male. There appears to be three species—a small one, a medium-sized one with all tibiæ clear yellow, and a black one. I now describe the first two.

Ecacanthothrips coxalis, sp. n.

Length, ♂ 1·75, ♀ 2·1 mm.

This species (and the following one) has the fore-coxæ in the ♂ simple, and in the shape of the fore-femora and teeth comes nearest to *E. steinskyi* (Schmutz), but is only very minutely pilose. Colour dark reddish-brown, including the hind and intermediate tibiæ; fore-tibiæ greyish-yellow, with outer and inner margins brownish. Antennæ just about 2·0 the length of head, with joints 1 black, 2 to 4 entirely chestnut-brown, 5 to 8 lighter grey-brown with basal halves of 5 and 6 yellow, 4 broadly claviform, 5 much narrower and 3 to 5 subequal in length.

Head inclined to be broadly subcarinate dorsally, 1·65 times as long as broad; at least two stout genal spines on each side, postocular bristles not as long as the eyes, and a pair of knobbed subgenal setæ as in *bryanti* but much shorter.

Tube short, very stout; approximately 0·45 the length of the head.

Hab. W. SARAWAK, neighbourhood of Mt. Matang; 2 ♀s (1 to light), December 1913, and 1 ♂, February 1914 (*G. E. Bryant*).

Ecacanthothrips flavipes, sp. n.

♂.—Length about 2·6 mm.

Very dark brown, almost black, shining; all tibiæ and tarsi clear yellow. Antennal joints 4 and 5 yellow, shaded to brown basally and distally; joints 4 and 6–8 more slender than in *coxalis*; 4 and 5 subequal and each apparently longer than 3.

Head much as in *coxalis*, with the cheek-spines stouter; postocular bristles longer and the subgenal setæ distinctly shorter than in that species. Tube stout, about 0·6 the length of the head.

Easily separated from *coxalis* by its larger size, distinctive coloration of legs and antennæ, longer tube, and the stouter fifth and more slender fourth antennal joints. The setæ on fore-femora are not quite so minute, and the lower tooth is sharper and not so stout.

Hab. W. SARAWAK, Mt. Matang, at 1000 feet; one on a white flower and three on dead bark, December 1913 (*G. E. Bryant*).

From the ANNALS AND MAGAZINE OF NATURAL HISTORY,
Ser. 8, Vol. xvii., *March* 1916.

Brief Descriptions of new Thysanoptera.—VII.

By RICHARD S. BAGNALL, F.L.S.

Suborder TEREBRANTIA.

Family **Thripidæ.**

Heliothrips frontalis, sp. n.

H. hæmorrhoidalis group.

♀.—Length about 1·15 mm.

Head, prothorax, pterothorax, and apex of abdomen golden-brown, shaded to brown laterally; frons brown; legs yellow, femora slightly deeper in coloration than the tibiæ, especially the intermediate pair. Body, excepting apex, chestnut-brown, with a sublateral pair of black rings or "eye-spots" on tergites 3 to 7. Antennæ broken in the unique specimen except the first two joints, which are light yellow. Fore-wing clouded with yellowish-brown at base and with the veins in the third sixth (or more) and the fifth sixth dark brown; veins otherwise except at extreme apex (distal sixth), where they are colourless, yellowish to light yellowish-brown.

Head subquadrate, strongly reticulated, about 0·8 as long as broad across eyes; cheeks very slightly arched behind eyes, and then as faintly sinuate or convergent posteriorly. Eyes small, only occupying about one-third the length of the head, and the space between them at least 2·5 times the width of one of them. Antennæ . . . . Vertex produced into an exceptionally prominent hump, with anterior ocellus facing forwards at summit and the posterior pair evidently flanking the sides.

Prothorax only about 0·7 the length of the head, transverse, with angles rounded; widest near posterior angles, where it is twice as wide as long; surface with network reticulation as in head, except a belt across disc. Pterothorax widest at junction of meso- and metathorax. Legs much as in allies, hind-tibiæ long, slender basally. Wings reaching to sixth abdominal segment, fore-wings slightly upturned distally, with veins (including marginal) strong; upper vein fused with costa; lower vein joining the hind-margin at or just before the distal sixth. Costal fringe of about fifteen curved setæ; lower cilia also sparse, fumate, rather long, slender, and wavy.

Abdomen comparatively heavy, elongate-ovate, and about 1·4 times as broad as the pterothorax at broadest. Tenth abdominal segment long, more than twice as long as broad near base, divided above. Apical setæ vestigial, a pair on 9, at hind angles, only about 0·3 the length of segment 10.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. AUSTRALIA, Healesville, Victoria; on *Senecio duyardeus*, 1 ♀ only (*R. Kelly*).

Genus AUSTRALOTHRIPS, nov.

Strong network reticulation. Antennæ 8-segmented, style normal, not setiform; joint 2 quadrate, cup-shaped, hollow at apex for reception of 3. Head transverse, hind-angles prominent; eyes prominent; maxillary and labial palpi 3- (?) and 2-jointed respectively.

Prothorax without any prominent setæ, transverse, with lateral, explanate, wing-like margins. Wings straight, not reticulated; fore-wing with strong ring-vein, upper vein merged in costa, and lower vein appearing as a median vein; no cilia or setæ on costa, no setæ on veins, and lower margin with cilia fine. Hind-wing with strong median vein; a series of slender setæ or cilia on upper margin and a long slightly wavy fringe on lower margin.

Tenth abdominal segment short, broad, cylindrical.

Pterothorax and abdomen much as in *Rhipiphorothrips*.

Type. *Australothrips bicolor*, mihi.

Differs from *Dinurothrips*, the only other genus with explanate lateral margins of the prothorax, in the simple antennal style and the structure of fore-wings, which are without setæ and cilia on the costa.

Australothrips bicolor, sp. n.

♀.—Length about 1·1 mm.

Orange-yellow; head, prothorax, mesothorax, scutular area, and sides of metathorax dark chestnut-brown; fore and intermediate femora dark brown; hind-femora and fore and intermediate tibiæ lightly tinged with brown. Antennæ with joint 6 apically and style brown; first joint lightly tinged with brown. Scale of fore-wing, small patch adjoining, and mid-vein and cilia of hind-wing brown.

Head about 1·8 times as broad as long, cheeks slightly converging, and hind angles prominent; network reticulation of surface strong, especially below an arcuate raised line behind eyes. Eyes prominent, space between them about twice the width of an eye. Vertex sinuate on each side of raised part, having the antennæ, which are twice as long as the head, seated in the sinuations. First antennal joint short; second quadrate, with distal cup-shaped hollow for reception of 3; 3 long, claviform, constricted at apex; 4 and 5 cylindrical, with minute stem, and 4 also narrowly constricted at apex; 6 broadest basally; 7 and 8 together styliform, and the relative lengths and breadths as follows:—

$$\frac{16 : 34 : 48 : 28 : 24 : 22 : 8 : 13}{20 : 30 : 16 : 17 : 17 : 14 : 7 : 5}.$$

Prothorax as long as or only slightly longer than the head, and (excluding the lateral explanate margins) as broad as the head. Legs comparatively short and stout.

Posterior margins of abdominal tergites with more or less regularly placed, minute, blunt projections; setæ on segment 9 short and those on 10 very short, colourless.

♂.—Smaller, more slender. Lemon-yellow where orange-yellow in ♀. Tergite 8 set with four long and rather stout spines set on an arcuate series of tubercles.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. AUSTRALIA, Healesville, Victoria; on *Eucalyptus viminalis* (R. Kelly).

Tæniothrips major, sp. n.

♀.—Length about 2·0 mm.

Colour dark chestnut-brown; fore-tibiæ, hind-tibiæ basally, all tarsi, and third antennal joint not quite so dark. Fore-wings brown, slightly lighter distally.

General form as in *T. inconsequens* (Uz.).

Head almost as long as broad; eyes bulging, coarsely facetted, pilose; cheeks swelling out from behind eyes as in *T. primulæ* and *inconsequens*. A series of dorsal and lateral setæ on a line behind eyes. Ocelli large; a pair of very long and strong inter-ocellar bristles situated between the posterior ocelli; a shorter pair on vertex close to inner margins of eyes and beyond the anterior ocellus, which is directed forwards. Dorsal surface transversely striate in basal half or thereabouts. Antennæ long and slender, about 2·3 times the length of head; joints 3 and 4 fusiform; relative lengths of joints:—16 : 22 : 40 (with stem) : 36 : 25 : 32 : 4 : 5; forked trichomes on 3 and 4 long and slender.

Prothorax transverse, not quite as long as the head; broadest at posterior angles; bristles at posterior angles long and slender; a line demarcating posterior margin; a pair of longish mid-dorso-lateral setæ, and several short setæ, curved and chiefly lateral. Pterothorax large. Wings long, strong, pointed at apex, reaching to ninth abdominal segment; setæ slender. Fore-wings with three or four setæ on distal half of upper vein, namely, one just within the distal half and 1+0+1 or 1+1+1 in the distal fifth or thereabouts.

Abdomen elongate, pointed at apex from base of segment 8; apical bristles long, especially those on 9, which is also furnished with a pair of shorter dorsal bristles.

This is a true *Tæniothrips*, coming nearest *inconsequens* (*pyri*), from which it differs chiefly in the much larger size and darker coloration, the chætotaxy, and in the slender antennæ.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. INDIA, Kulhara, Garhwal, 11,700 feet altitude; in flowers of rhododendron, 5. vi. 10, together with *Physothrips longiceps*, sp. n. (*A. D. Imms*).

Tæniothrips inconsequens, Uzel.

1895. *Physopus inconsequens*, Uzel (and others).
1904. *Euthrips pyri*, Daniels (and others).

For some time I have considered that the well-known pear-thrips, *P. pyri*, was synonymous with the earlier-described *P. inconsequens* of Uzel, a conclusion that Mr. C. B. Williams had also come to. On going into the question together recently, comparing material from North America, Central Europe, and England, we confirmed this opinion.

It is interesting to note that in the Czech account of the habitat of *P. inconsequens* in Uzel's monograph the food-plant *Prunus cerasus* is mentioned.

For a pest of such importance the trivial name *inconsequens* is unfortunate.

Odontothrips fasciatipennis, sp. n.

♀.—Length 1·3 mm.

Dark brown, pterothorax rather lighter; fore-tibiæ light yellow, shaded to grey-brown basally; apices of intermediate and hind tibiæ and all tarsi light yellow; antennal joints 3 and 4 yellow.

Fore-wing with basal third clear, then a band or patch of brown, and the distal two-fifths with but the slightest tinge of grey; cilia grey-brown. Posterior ocelli on a line drawn behind eyes and contiguous to their inner angles. Fore-tibial teeth small, sharp, the larger sharply bent; fore-tarsus apparently without tooth.

This species differs from both *phaleratus* (Hal.) and *intermedius* (Uz.) in the coloration of the wings.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. S. AUSTRALIA, Outer Harbour, Adelaide; collected by Prof. Poulton in the flowers of *Mesonbryanthemum*, Aug. 28th, 1914.

Genus PHYSOTHRIPS.

a. *Sjostedti-usitatus* group.

Physothrips usitatus, Bagn., var. *cinctipennis*, nov.

Fore-wings with the middle third and extreme tip greyish-brown. Relative lengths of antennal joints as follows:—
12 : 16 : 25 : 25 : 16 : 23 : 7 : 8.

Distinguished from the type-form (only known from India) by the distinct clear band near distal end of fore-wing. This band is weakly suggested in the Indian specimens.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. N. QUEENSLAND, Brandon; on small flowers (pea), 16. x. 14 (*R. Kelly*).

Physothrips brunneicornis, sp. n.

♀.—Length 1·4 to 1·5 mm.

Colour brown, the antennæ, head, prothorax, intermediate and hind femora and tibiæ, and apical abdominal segments inclined to be darker. Antennæ unicolorous, fore-tibiæ yellow, shaded with greyish brown along margins; all tarsi yellow. Fore-wings faintly clouded with light grey-brown near base; basal third or thereabouts clear, thence smoky-brown to tip excepting for an ill-defined clear patch at about the commencement of the distal fifth; setæ and cilia dark.

Head about 0·7 as long as broad and not quite as long as the prothorax; a defined area of the dorsal surface behind transversely striated. Eyes coarsely facetted, minutely pilose; cheeks not arched, tending to widen posteriorly; ocelli large, posterior pair above a line drawn across hind margins of eyes; interocellar bristles long and strong, placed between the anterior ocellus and the posterior pair. Antennæ seated below vertex, about 2·5 times as long as the head; relative lengths of joints 3 to 8 as follows:—22 : 22 : 14 : 20 : 5 : 6. Joints 5 and 6 somewhat broadly united and distinctly more slender than the preceding; forked trichomes on 3 and 4 long and stout.

Prothorax much as in *P. usitatus*.

Fore-wing and arrangement of setæ as in *P. usitatus*.

Abdomen about 1·15 times as broad as the pterothorax, segments 9 and 10 obconical; apical bristles long and stout; 9 with a rather short dorsal pair widely separated.

This species very closely approaches *P. usitatus*, Bagn., but is at once separated from it (as well as from *sjostedti*, Trybom, and *variabilis*, Bagn.) by the unicolorous antennæ. The antennal joints 3 and 4 would appear to be stouter and 6 shorter than in *usitatus*, whilst the fore-femora are concolorous with the prothorax.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. JAPAN, Kobe, April 1914 (*J. E. A. Lewis*). Reg. no. 144.

Physothrips seticollis (Bagnall).

Tæniothrips seticollis, Bagnall, 1915, Ann. & Mag. Nat. Hist. ser. 8, xv. p. 591.

This species cannot be referred to the genus *Tæniothrips* as exemplified by *inconsequens*, *primulæ*, and *major*, sp. n.

b. *Funtumiæ* group.

Physothrips kellyanus, sp. n.

♀.—Length 1·6 to 1·8 mm.

Very like *P. funtumiæ*, Bagn.

Dark chestnut-brown, antennæ with the distal constricted parts of joints 3 and 4 colourless; fore-tibiæ and all tarsi yellow. Fore-wings yellowish-brown, basally lighter; hind-wings also fumate, with ciliæ and median vein dark.

Head a little broader than long, eyes setose; interocellar setæ long. Relative lengths of antennal joints 3 to 8 as follows:—27 : 27 : 17 : 26 : 4 : 6.

Prothorax as long as or very slightly longer than head; setæ at hind angles long, but not stout, and one rather long pair in the postero-marginal series. Setæ on fore-wing long, upper vein with two in distal half near extreme end and 3 + 3 near base.

Apical abdominal bristles long.

♂.—Length about 1·2 mm., slender.

Each of the sternites 3 to 7 with numerous minute, roundish, irregular, pale depressions, those at angles, especially the anterior, slightly larger. Tergite 9 with a series of short spines in a line near posterior margin.

Colour of antennæ as in ♀; joint 6 abnormally long; relative lengths of joints 3 to 8 as follows:—26 : 25 : 13 : 36 : 3 : 4·5.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. N. QUEENSLAND, Brandon, ♂ and ♀ on a composite flower (? *Helianthus* sp.), 16. x. 14; Brisbane, numerous ♀ ♀ and 1 ♂ on *Acokeanthera spectabilis* (a South-African plant), in the Botanic Gardens, 23. x. 14.

VICTORIA, Ballarat, 1 ♂ on *Hypochæris radicata*, 18. i. 15.

One of the many interesting species discovered by Mr. Reg. Kelly, after whom I find pleasure in naming it.

The ♂ is easily separated from ♂ *Ph. funtumiæ* by the nature of the depressions in sternites 3 to 7, the line of spines in ninth tergite, the unicolorous antennæ, and the exceptionally long sixth joint.

c. *Pallipennis* group.

Physothrips brevicornis, sp. n.

♀.—Length 1·2 to 1·3 mm.

Colour dark brown, fore-tibiæ, apices of fore-femora and of hind and intermediate tibiæ and all tarsi yellowish; fore-wings wholly greyish yellow-brown, hind-wings greyish at base. Antennæ with first joint and style grey to grey-brown, second dark brown, 3 to 5 yellowish, the latter very lightly tinted with grey; 6 yellow, with distal half grey-brown.

Head transverse, about 0·65 as long as broad, cheeks apparently converging posteriorly; eyes large, not bulging, coarsely facetted and very minutely setose; interocellar bristles moderately long. Antennæ short and rather stout, a little more than twice as long as the head; relative lengths and breadths of joints 3 to 8 as follows:—

$$\frac{32 : 29 : 26 : 36 : 6 : 11}{18 : 18 : 14 : 15 : 6 : 4},$$

3 to 4 broadly claviform.

Prothorax transverse, about 1·25 times longer than the head; bristles at posterior angles rather short, the inner one of each pair longer than the outer, and about 0·4 as long as the prothorax. Upper vein of fore-wing with 3 or 4 setæ (1 + 0 (or 1) + 1 + 1) in the distal half; in one specimen 4 are placed in the distal third; lower vein with 11 to 15 setæ.

Abdomen only slightly broader than the pterothorax, elongate-ovate.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. AUSTRALIA, Ballarat, Victoria; 3 ♀ ♀ on *Hypochæris radicata*, 28. i. 15 (*R. Kelly*).

Physothrips longiceps, sp. n.

♀.—Length 1·5 mm.

Colour chestnut-brown; fore tibiæ yellowish distally, margins dark; tarsi yellowish. Antennæ brown, joint 2 distally and 3 rather lighter, the latter inclined to yellowish basally. Fore-wings and cilia yellowish-brown.

Head long, about 0·85 as long as broad and as long as the prothorax; widened just behind eyes, cheeks subparallel; surface transversely striate, and vertex similarly striate. Eyes occupying about 0·5 the length of the head, coarsely facetted; postocular bristles absent; interocellar setæ situated just behind anterior ocellus, minute. Antennæ twice as long as the head; joints 3 and 4 fusiform, 5 and 6 broadly united, and 4 and 5 shortly constricted near base; style short; relative lengths of joints as follows:—11 : 17 : 26 (including stem) : 22 : 18 : 23 : 3 : 3. Forked trichomes on 3 and 4 moderately long.

Prothorax about 0·7 as long as broad; bristles at hind angles about 0·4 the length of prothorax.

Pterothorax large. Legs somewhat stout. Wings reaching to ninth abdominal segment, pointed; setæ moderately long, slender. Fore-wing with three setæ in distal half, viz., one just beyond the second third, and two in distal fifth; lower vein with 14–17 setæ.

Abdomen elongate-ovate, pointed at apex. Bristles on segments 9 and 10 long, slender; 9 with a pair of widely separated dorsal bristles.

♂.—Smaller and more slender.

Tergite 9 with a series of four closely set long setæ disposed practically in a straight line. Sternites 3–7 each with a small depression, gradually diminishing in size; 3 and 4 the largest, elliptical, 5–7 rounded, and 7 the smallest, minute.

Separated from *pallipennis*, Uz., by the long head, the coloration of antennæ and wings, the small depressions in sternites, and the length and disposition of setæ on the ninth tergite in the ♂.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. INDIA, Kulhara, Garhwal, 11,700 feet altitude; in flowers of rhododendron, 5. vi. 10 (*A. D. Imms*).

Physothrips calcaratus, sp. n.

♀.—Size and form much as in *P. vulgatissimus* (*pallipennis*). Colour evidently dark brown, with the fore-tibiæ and ends of the intermediate and hind-tibiæ lighter, and all tarsi yellowish. Antennæ brown, end of joint 2 and whole of 3 yellowish.

Head transverse, rather long; eyes coarsely facetted, sparsely and minutely setose; ocelli large, interocellar bristles long, placed between the posterior ocelli. Antennæ about 2·3 times as long as the head; joints 1 and 2 broader than any of the succeeding; relative lengths of joints as follows:—10 : 12 : 19 (including stem, which is rather long) : 16 : 12 : 17 : 2·5 : 3. 3 (excluding stem) and 4 subequal, fusiform; 5 narrower than 4 or 6, apex truncate.

Prothorax about 1·4 times as broad as long, and scarcely noticeably longer than head; bristles at hind angles very long, about 0·7 the length of the prothorax, slender. Legs somewhat stout; *fore tarsus with a sharp stout tooth near apex.* Wings longish, pointed apically; fore-wings uniform grey-brown; setæ long and slender, 3 to 5 in distal half of upper vein, namely, 1 just beyond middle of wing and 2 to 4 (1+1, 1+1+1, 2+1, or 2+2) in the distal fifth. Costa with about 25 and lower vein 17 longish setæ.

Abdomen elongate-ovate; apical bristles fairly long, a dorsal pair on 9; tergite 8 with a moderately long close fringe.

At once recognized by the fore-tarsal claw (analogous with *Thrips calcaratus*, Uz.) and the setæ of the upper vein of the fore-wing.

Hab. Bohemia; in coll. Uzel mixed with *Odontothrips phaleratus.*

Pseudothrips parvus, sp. n.

♀.—Length about 1·0 mm.

General colour yellow-brown to brown, abdominal segments 9 and 10 darker. Antennæ with first joint greyish, second and fifth to eighth grey-brown, 3, 4, and extreme base of 5 yellow, 4 tinged lightly with grey. Fore-wings wholly light yellowish-brown. Legs yellowish, more or less shaded with grey to brown, especially the femora and outer margins.

Head transverse, about 1·3 times as broad as long, and nearly as long as the prothorax; eyes coarsely facetted. Sixth antennal joint not divided. One prominent prothoracic bristle at each posterior angle and a shorter one just above. Both veins of fore-wing regularly set with setæ, 11 or 12 in each.

Abdomen elongate-ovate, sharply narrowed at apex; posterior margin of eighth tergite sparsely fringed. Apical bristles of both ninth and tenth* segments long; a dorsal series of minor setæ on 9 and a dorsal pair on 10; the latter segment divided above.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. N. QUEENSLAND, Brandon; on a composite flower (? *Helianthus* sp.), 16. x. 14 (*R. Kelly*).

Near *P. glaucus*, Bagn. (a South-African species), from which it may be separated, apart from coloration, by the fewer setæ on veins of fore-wings and the chætotaxy of the apical abdominal segments.

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From the Annals and Magazine of Natural History,
Ser. 8, Vol. xvii., *May* 1916.

Brief Descriptions of new Thysanoptera.—VIII.
By Richard S. Bagnall, F.L.S.

Suborder TEREBRANTIA.

Family **Æolothripidæ.**

Subfamily *OROTHRIPINÆ.*

Orothrips propinquus, sp. n.

♀.—Very like *O. australis*, Bagn., but stouter and larger (1·8 mm. long as against 1·5 mm.) and also darker in coloration. The head is shorter than the prothorax; the maxillary palpi are distinctly 8-jointed, whilst the antennal joints 3 and 4 are practically subequal, the relative lengths of joints 3 to 9 being as follows:—

O. propinquus, sp. n., 108 : 102 : 51 : 39 : 28 : 20 : 15.
O. australis, Bagn., 104 : 82 : 52 : 32 : 24 : 18 : 12.
O. tenuicornis, sp. n., 165 : 126 : 66 : 48 : 50 : 30 : 19.

All legs dark grey-brown; fore-tibiæ and tarsi a shade lighter—yellowish-grey-brown. Colour of antennæ as in *O. australis.* Fore-wings broader than in *O. australis*, with the brown markings across middle and tip occupying only about 0·20 and 0·15 of the total length, the comparative extent of areas being as follows:—

	propinquus.		*australis.*		*tenuicornis.*	
	Fore-margin.	Hind-margin.	Fore-margin.	Hind-margin.	Fore-margin.	Hind-margin.
Clear	9·0	8·0	5·0	4·5	6·0	6·0
Dark	3·5	5·5	5·5	6·0	6·5	6·0
Clear	5·0	3·0	2·0	2·5	3·5	3·0
Dark	2·5	3·5	3·5	3·0	3·0	4·0
Comparative length .	20		16		19	

Setæ on veins of fore-wings minute.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. AUSTRALIA, Creswick, Victoria; on sweet pea, ♀s only, 17.i.15 (*R. Kelly*).

Orothrips tenuicornis, sp. n.

♀.—Near *O. propinquus*, colour of abdomen lighter, and apical abdominal bristles shorter and more slender. Antennæ more slender and the third joint long, clear lemon-yellow.

Relative lengths of antennal joints and of the areas of fore-wing (which latter approximate *australis* more than *propinquus*) as shown in tables under description of *O. propinquus*. Maxillary palpi 7-jointed.

Setæ on veins of fore-wings minute.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. AUSTRALIA, Healesville, Victoria; 3 ♀s from flowers of *Erythræa australis*, December 1913 (*A. E. Shaw and R. Kelly*).

Family **Thripidæ.**

Pseudothrips achætus, sp. n.

♀.—Length 1·1 to 1·2 mm.

Chestnut-brown; fore-legs yellow, femora tinged with grey-brown and tibiæ lightly with grey; intermediate and hind legs brown shaded with grey, tibiæ yellowish distally; all tarsi yellowish. Antennæ with joint 1 light grey-brown, 2 concolorous with head, 3 yellowish-brown, 4–5 yellowish-brown to grey-brown and 6 to 8 grey-brown to brown. Fore-wing yellowish-brown, a shade lighter at base.

Head transverse, about 0·6 as long as broad; eyes large, not bulging, somewhat coarsely facetted, pilose; ocelli large; no post-ocular or interocellar bristles. Antennæ longer and more slender than in *parvus*, Bagn., about 2·3 times the length of the head; relative lengths of joints approximately as follows:—7 : 12 : 17 (including stem) : 15 : 13 : 17½ : 3 : 4.

Prothorax scarcely longer than the head, and about 0·6 as long as broad; hind margin with a series of moderately stout setæ, but no prominent bristles at hind angles. Wings pointed at apex; both veins of fore-wing regularly set with setæ.

Setæ at apex of abdomen stouter than in *P. parvus*, a pair of short curved dorsal setæ on 9, and posterior margin of tergite 8 not fringed.

♂.—Smaller, lighter, all legs yellowish marked with brown; sternites apparently without transparent areas.

Easily separated from *P. parvus*, Bagn., by the dark colour of body, the comparatively shorter head, longer and more slender antennæ, and the absence of prothoracic bristles.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. S. AUSTRALIA, Mt. Lofty Range, Adelaide; amongst a tube of thrips from flowers of *Acacia myrtifolia* and *Epachris impressa*, Aug. 9, 1914 (*E. B. Poulton*), Reg. 41.

Genus PHYSOTHRIPS, Karny.

a. *Seticollis* group.

Physothrips setipennis, sp. n.

This species is very closely related to the Western Australian species, *Physothrips seticollis* (Bagn.). The antennæ are brown except joint 3 which is clear yellow, and the base of 4 yellowish.

Head as long as or slightly longer than the prothorax. Antennæ about 2·25 times the length of the head, longer than in *seticollis*; relative lengths of joints as follows:—12 : 16 : 27 (with stem) : 26 : 15 : 22 : 3 : 4.

Prothorax with the bristles at hind angles (which are exceptionally slender and light in colour in *seticollis*) somewhat stout and dark, about 0·65 the length of prothorax; surface somewhat closely and irregularly set with minute setæ. In *seticollis* these setæ are regularly disposed (including three widely-seated pairs down the centre), stouter and about twice the length.

Apical abdominal bristles distinctly stouter and darker; ninth tergite with a pair of rather short dorsal bristles, moderately widely separated and the posterior margin of the eighth tergite with a close and moderately long microscopic fringe.

Upper vein of fore-wing regularly set with setæ for the whole length as in *seticollis*.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. AUSTRALIA, Healesville, Victoria; on cultivated white briar, 25. i. 14 (*R. Kelly*).

b. ? group.

Physothrips flavidus, sp. n.

♀.—Exactly as in *Thrips flavidus*, sp. n., but having the antennal style 2-segmented.

In this case the type is distinctly of the genus *Thrips*, and closely allied to *T. flavus*, Schr., and this as well as *Physothrips albipes* are named in the genus *Physothrips* as well as in *Thrips* to avoid confusion by other workers who may receive only one or other of the two forms. Further material may enable us to write upon this curious phase, so far only noticed in Japanese material.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. JAPAN, Kobe; 1 ♀ with *T. flavidus*, sp. n., June 1915 (*J. E. A. Lewis*).

c. *Pallipennis* group.

Physothrips pallipes, sp. n.

♀.—Length 1·1–1·3 mm.

Head and thorax brown lightly tinged with grey, abdomen black-brown. Antennal joints 1 grey-brown, 2 brown, 3 clear yellow, 4 to 8 brown, with 4 yellowish at extreme base and 5 inclined to be lighter at base. Legs yellow, the fore-femora lightly and the intermediate and hind femora more strongly shaded with grey-brown. Outer margin of the fore and intermediate tibiæ shaded with grey-brown, and the hind tibiæ with grey in some specimens. Fore-wings dark smoky-grey, basal fourth light grey.

Head about 0·65 as long as broad, broadest across cheeks which are gently arched; eyes large, coarsely facetted, pilose. Ocelli large, anterior one protected by a pair of rather short setæ. Antennæ about 2·5 times as long as the head; joints 3 and 4 fusiform; relative lengths of joints as follows:—18 : 32 : 48 : 45 : 30 : 42 : 5 : 5.

Prothorax about 1·2 times as long as the head, about 0·7 as long as broad; surface sparingly setose; hind margin depressed; bristles at posterior angles stout, rather short, not much more than 0·4 the length of the prothorax. Setæ on fore-wings rather long; three widely spaced setæ in distal half of upper vein; lower vein with a series of 15–18 and costa with about 30.

Apical abdominal bristles moderately long, a short dorsal pair on segment 9; posterior margin of tergite 8 with a short irregular fringe.

Easily separated from *P. vulgatissimus* (*pallipennis*) by the coloration of body, legs, and wings.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. JAPAN, Kobe Harada ; on chrysanthemum, 15. xi. 15, Reg. 128 and 129 ; Kobe, vi. 15, Reg. 126 (*J. E. A. Lewis*).

Physothrips albipes, sp. n.

♀.—Exactly the same as *Thrips albipes*, Bagn., but with the antennal style 2-segmented. Somewhat closely related to *P. pallipes*, sp. n.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. JAPAN, with *Thrips albipes*, Bagn., Okinawa, Luchu Isl., on nasturtium, v. 13 ; Kobe, vii. 13 (*J. E. A. Lewis*).

Dendrothrips sexmaculatus, sp. n.

♀.—Length 0·6 to 0 7 mm.

Like *D. degeeri*, Uz., but smaller, approaching *D. saltatrix*, Uz., in size.

Head, prothorax, pterothorax, and abdominal segments 1, and 7 to 9 dark chestnut-brown ; abdominal segment 10 lighter, 2 and 3 grey-brown, 3 posteriorly and 4 to 6 light yellow to greyish-yellow, the latter three segments each with a pair of dark brown spots. Wings dark grey with the distal fifth (0·2) white or clear. Legs brown to grey-brown, hind tibiæ inclined to be lighter ; all tarsi yellowish.

Surface of head near base irregularly striate, inclined towards reticulation ; prothorax sparingly and minutely setose. Antennæ about 2·5 times the length of the head. Segment 1 light grey-brown, short ; 2 dark chestnut-brown, globular, bigger and much broader than any of the others ; 3 and 4 yellowish, with the slightest tinge of grey ; 5 greyish-yellow shading to grey distally ; 6 to 8 grey-brown ; 3 and 4 subequal, relative lengths of segments 4 to 8 approximately as follows :—10 : 11 : 11 : 4 : 4 ;—6 narrowing to style and narrower than 5, not divided.

Separated from *D. degeeri*, Uz., by the white band at base of wings, the entire sixth antennal joint, the coloration of antennæ and body, and the smaller size ; and from *D. saltatrix*, Uz., by the white band at base of wing, the shorter intermediate antennal joints, and the coloration of body, &c.

Type. British Museum of Natural History.

Hab. CEYLON, Peradeniya, No. 47/13 (*A. Rutherford*) per the Bureau of Entomology. Reg. no. 240.

Genus EUCHÆTOTHRIPS, nov.

Head not quite as long as broad, *broadest anteriorly; vertex broadly rounded*, with antennæ seated below; *a dorso-lateral hump or prominence behind each eye.* Maxillary palpi apparently 3-jointed. Antennæ with single-jointed style, 7-jointed.

Prothorax about as long as the head, *a pair of long mid-lateral bristles* as well as those at posterior angles; *antero-marginal setæ rather long.* Wings as in *Thrips* s. s. *Outer margins of all tibiæ with a pair of long outstanding slender hairs or bristles near apices and one or two, not quite so long, near middle.*

Abdomen sharply narrowed from segment 8 to apex, terminal bristles long and strong.

Nearest *Thrips* (*Bagnallia* group), but characterized at once by the italicized features in above diagnosis.

Type. *Thrips króli*, Schille.

Genus THRIPS s. s.

a. *Flavus* group.

Thrips flavidus, sp. n.

♀.—General colour, shape, and size as in *Thrips flavus*, Sch. (as described by Uzel). Antennæ about 2·5 times as long as the head; first joint white, 2 deep yellow tinged with grey; 3 lighter yellow with distal third grey-brown; 4 dark grey-brown, yellow basally; 5 dark grey-brown with basal threé-fifths (0·6) sharply light yellow; 6 dark grey-brown, inclined to be yellowish basally in some specimens; style dark grey-brown. Relative lengths of segments 3 to 7 as follows:—30 : 28 : 20 : 28 : 7.

Prothorax about as long as head, more transverse than in *flavus*; setæ at hind angles shorter than in *T. flavus* (16 as to 23). Apical abdominal setæ much as in *T. flavus*, but relatively shorter.

♂.—Smaller and more slender, whitish. Antennal joint 6 with the basal two-fifths (0·4) distinctly yellow. Eighth tergite with a weakly arcuate series of long slender setæ.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. JAPAN, Kobe, June 1915 (*J. E. A. Lewis*).

b. *Physopus* group.

Thrips griseus, sp. n.

♀.—Size and general form as in *T. physopus.*

Dark grey to grey-brown; fore-tibiæ light yellow shaded on their outer margins with grey-brown; all tarsi yellowish; fore-wings entirely grey, hind-wings lighter. Antennæ grey-brown, joint 3 yellowish and 4 brownish-yellow basally. 5 lighter at extreme base.

Head as in *T. physopus*, transverse, with cheeks widest behind eyes and thence converging to base. Ocelli rather large. Antennæ much as in *T. physopus*, but with the intermediate joints comparatively stouter; relative lengths of joints 3 to 7 approximately as follows:—20 (with stem): 17 : 12 : 19 : 6.

Prothorax wider than and at least as long as the head, 1·7 times as broad as long; bristles at hind angles moderately long and stout, 0·45 the length of the prothorax. Legs moderately stout, hind tibiæ with a double row of six spines to apex within. Setæ on costa and veins of fore-wings as in *T. physopus*, dark.

Bristles at apex of abdomen dark, long and strong, twice as long as the segments carrying them; a short and not very strong dorsal pair on segment 9. Posterior margin of tergite 8 with a short fringe, the cilia apparently running in pairs; segment 10 divided above.

Sharply distinguished from *T. physopus* by the coloration and form of antennæ, and the colour generally.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. JAPAN, 2 ♀s, Kobe, vi. 15 (*J. E. A. Lewis*).

Suborder TUBULIFERA.

Family **Idolothripidæ.**

Genus GIGANTOTHRIPS, Zimmermann.

1900. *Gigantothrips*, Zimmermann, Bull. de l'Inst. Bot. de Buitenzorg, No. vii.

1908. *Panurothrips*, Bagnall, Trans. Nat. Hist. Soc. Northumberland & Durham, n. s. iii. p. 208.

Gigantothrips gracilis, Bagnall.

Panurothrips gracilis, Bagnall, *l. c.* p. 208 (1908).

This species is closely relately to *Gigantothrips elegans*, Zimm., but compared with specimens of the latter in my collection (*ex et teste* Karny), *gracilis* is larger and has the tube very noticeably longer, about 0·5 as long again as in *elegans* (18 : 12); viz., in *gracilis* about as long as the abdominal segments 7–8 together, and in *elegans* about 0·75 the length of those segments.

Genus ELAPHROTHRIPS, Buffa.

Idolothrips, Hinds, Bagnall, and others.
Elaphrothrips, Buffa, Redia, v. p. 162 (1909).

Genus IDOLOTHRIPS, Haliday.

Idolothrips, Froggatt, Proc. Linn. Soc. N.S.W. 1904, pt. 1.
Acanthinothrips, Bagnall, Trans. Nat. Hist. Soc. Northumberland & Durham, n. s. iii. p. 207 (1908) (and others).

Mr. Froggatt is undoubtedly right in assigning *Idolothrips marginata* and *spectrum* as ♀ and ♂ of the one species, and I withdraw anything I may have written in 1908 on that point. I do not agree with him, however, in that *I. lacertina*, Hal., is a "smaller and more variable form of the ♂" (*spectrum*). Regarding the female *marginata* as the genotype of *Idolothrips*, I erected the genus *Acanthinothrips* for the strongly characterized species *spectrum*, but being sexes of one species they must be placed in the genus *Idolothrips*, and the *Idolothrips* of most modern authors must be known as *Elaphrothrips*. The females of the two genera are very much alike.

Idolothrips marginata, Haliday.

1852. *Idolothrips marginata*, Haliday in Walker, Homopt. Ins. Brit. Mus. p. 1096.
1852. *Idolothrips spectrum*, Haliday in Walker, Homopt. Ins. Brit. Mus. p. 1097.
1904. *Idolothrips spectrum*, Froggatt (with *marginata* (♀) and *lacertina* as synonyms), Proc. Linn. Soc. N.S.W. pt. 1, p. 54.

I. marginata, being the first used, would seem to be the name by which this species should be known.

Idolothrips lacertina, Haliday.

1852. *Idolothrips lacertina*, Haliday, *l. c.* p. 1097.
1904. *Idolothrips spectrum* (in part), Froggatt, *l. c.* pt. 1, p. 54.

The ♂, apart from being noticeably much smaller and more slender than the ♂ of *marginata*, widely and constantly differs in the structure of the lateral abdominal processes, as may be seen by the accompanying table and rough figures.

	I. spectrum, ♂.		*I. lacertina*, ♂.	
Process on segment	Approximate length of process.	Approximate length of spine or bristle compared with length of process.	Length of process.	Length of spine or bristle.
2	5 times as long as breadth at apex.	*Spine* 0·3 as long.	As long as breadth at apex.	*Spine* 2·0 as long.
3	4·5 „ „	*Spine* about 0·45 as long.	About 2·0 as long.	*Bristle-spine* 3·0 as long.
4	4 „ „	Slender *spine* 0·8 as long.	About 1·5 as long.	*Bristle* 6·0 as long.
5	3 „ „	*Bristle* 3·0 as long.	As long.	*Bristle* 6·0 as long.
6	3·5 „ „	*Bristle* 2·5 as long.	Slightly longer than.	*Bristle* 6·0 as long.
7	4 „ „	*Spine* about 0·5 as long.	About 2·0 as long.	*Bristle* 4·0 as long.
8	5·6 „ „	*Spine* about 0·35 as long.	About 2·5 as long.	*Spine* about as long.

Fig. 1.

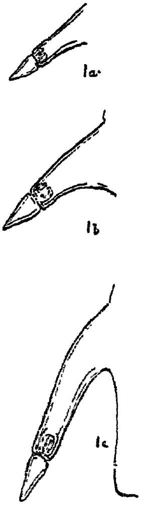

Fig. 2.

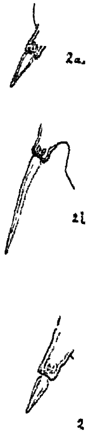

Fig. 1.—*Idolothrips marginata*, Hal., ♂.
Fig. 2.—*Idolothrips lacertina*, Hal., ♂.

Left lateral processes of second (*a*), third (*b*), and eighth (*c*) abdominal segments.

In *lacertina* the head is shorter compared to its breadth and the genal spines are fewer, shorter, and less strong than in *marginata* (♂), whilst the third antennal joint is approximately as long (compared to 1·25 times as long in *marginata*) as the length of head behind eyes. The surface-setæ of tube are, on the other hand, slightly longer and stronger compared to the breadth of the tube than in *marginata.*

I have an abundant material of these interesting insects, chiefly through Mr. Kelly's kindness, and hope in the near future to make close descriptions of the two species.

Family **Megathripidæ.**

This family will probably have to be reduced as a subfamily of Idolothripidæ.

Megathrips quadrituberculatus (Bagnall) *.

1908. *Idolothrips quadrituberculatus,* Bagnall, Trans. Nat. Hist. Soc. Northumberland & Durham, n. s. iii. p. 210, pl. vii. fig. 9.

A female example sent to me by Mr. Lewis in 1912 is certainly the species I described as *Idolothrips 4-tuberculatus* ; the tube is present and suggests that the species is a Megathripid. In 1915 I received a ♂ *Megathrips* which despite certain colour-differences is presumably the ♂ of the same species.

♀.—Length (including tube) 5·0 mm.

Sixth antennal joint (not described in type) with basal half yellow ; 7 and 8 black. Antennæ twice as long as the head (which latter is very slightly produced beyond eyes) ; very slender, excepting the two basal joints ; relative lengths of joints 3 to 8 as follows :—64 : 53 : 43 : 32 : 17 : 15. Joint 2 constricted near base and curved outwards.

Tube long, 1·8 as long as the head, slightly curved upwards before apex ; about 6 times as long as broad near base, and with tip about 0·45 as broad as at base ; sparingly furnished with fine backwardly directed setæ. Bristles at apex broken off.

♂.—Length (including tube) 4·5 mm.

A darker specimen than the ♀. Fore-tibiæ brown excepting at apex and basally ; intermediate tibiæ brown except at apex, and hind tibiæ brown except the extreme base and distal third which are yellow. Antennæ more than twice as long as the head; relative lengths of joints 3 to 8 as follows:—61 : 50 : 45 : 33 : 16 : 14.

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* In a footnote to a paper on some Japanese Thysanoptera Dr. Karny mentions eight then-known species, and refers to this as *Idolothrips tuberculatus.* I mention this error to avoid confusion, as Hood has described an *Idolothrips* under that name from U.S.A.

Abdominal segment 6 furnished with a pair of lateral spine-like tubiform processes at anterior angles, slightly outwardly directed but scarcely curved, and not quite reaching the line of the posterior margin; 8 with a pair of lateral tooth-like processes near posterior angles.

Tube about 1·5 times as long as head, stout near base but sharply constricted in the first fourth; more strongly setose (and with longer setæ) than in the ♀. Terminal hairs short.

Hab. JAPAN, Kobe, 1 ♀, 1912; 1 ♂, April 1915, the latter Reg. no. 139 (*J. E. A. Lewis*).

Family **Phlœothripidæ** s. l.

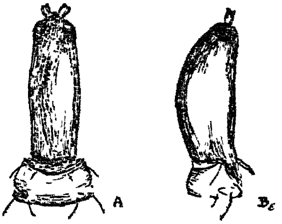
a. *Docessissophothrips* group.

Docessissophothrips longiceps, sp. n.

♀.—*Forma aptera.* Length about 5·5 mm.

Colour deep blackish-brown, second antennal joint reddish-brown (rest of antennæ broken off in the unique specimen); all tibiæ orange-yellow, tarsi clouded with brown.

Fig. 3.



Head and prothorax of *Docessissophothrips longiceps*, sp. n.

A. Viewed dorsally. B. Viewed laterally.

Head more than 4·5 times as long as the prothorax and 2·7 times as long as broad at middle; dorsum gently arched in profile. Eyes small, finely facetted, not prominent; post-ocular bristle apparently absent.

Fore-margin of prothorax strongly emarginate; bristles moderately long, colourless. Pterothorax short; wings absent.

Abdomen much as in *D. major*; tube long, about 0·72 the length of the head, about 5·0 times as long as broad near base, narrowed in the distal fifth, the apex being about 0·6 as wide as near base; surface sparsely and minutely setose.

At once separated from *D. major* by the length of the head, the non-prominent eyes, and the coloration of the tibiæ.

Type. British Museum of Natural History.

Hab. 1 ♀, Madeira (*Wollaston*).

This makes the sixth species of the genus, each as yet known from but a single example. Ignoring *D. monstrosus*, which becomes the type of a new genus characterized below, the remaining five species fall into two well-defined groups as follows:—

1. Length 3·0 mm. or under, head shorter and broader, less than twice as long as broad; containing *ampliceps*, Bagn., and *laticeps*, Bagn.
2. Length more than 5·0 mm., head longer and 2 to 3 times as long as broad; containing *major*, Bagn., *frontalis*, Bagn., and *longiceps*, sp. n.

Genus EGCHOCEPHALOTHRIPS, nov.

Separated from *Docessissophothrips*, Bagn., by the extreme form of the head which, viewed dorsally, is as figured in the original description of *D. monstrosus*. It is extraordinarily adpressed and, viewed dorsally, represents the end view of a stoutish "plate," with a slight swelling (representing the cheeks) on each side of the marked carina.

Type. *Docessissophothrips monstrosus*, Bagnall.

b. *Trichothrips* group.

Œdemothrips (?) *propinquus*, sp. n.

♀.—Length 1·8 mm.

Colour brown, the last 4 or 5 abdominal segments darker. Legs yellowish shaded with light grey-brown. First antennal joint light yellowish-brown, 2 slightly darker, 3 brown with basal half clear yellow, 4 and 5 brown with basal thirds yellowish, 6 to 8 totally brown.

Almost the same as *Œdemothrips* (?) *brevicollis*, Bagn. (Japan) in general form. The head is not quite so markedly convergent behind, the prothorax is not so short compared to its breadth, and the tube is stouter.

Antennæ about 2·4 times the length of the head; relative lengths of joints 3 to 8 approximately:—31 : 29 : 28 : 24 : 19 : 14.

Prothorax about twice as broad as long; setæ at posterior angles widely spaced, somewhat short and stout; the outer longer than the inner, about 0·4 the length of the prothorax.

Tube short and stout, about 0·9 as long as the head; 1·45 times as long as broad at base, and 0·45 as broad at tip as at base; terminal bristles light coloured, about 0·7 the length of the tube.

Very closely allied to *brevicollis*, but at once recognized by the coloration of the body and the antennæ.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. AUSTRALIA, Badger Weir, Healesville, Victoria; 1 ♀ on clover, 6.iv.15, Reg. 120 (*R. Kelly*).

c. *Leptothrips* group.

Gynaikothrips uzeli (Zimmermann).

1909. *Leptothrips flavicornis*, Bagnall, Trans. Nat. Hist. Soc. Northumberland & Durham, n. s. iii. pt. 2, p. 528, pl. xiv. figs. 6–8 (from Madeira).
1909. *Phlœothrips longitubus*, Bagnall, *l. c.* n. s. iii. pt. 2, p. 534, pl. xiv. figs. 21 & 22 (from Java).
1910. *Leptothrips flavicornis*, Bagnall, Ann. Soc. Ent. Belg. liv. p. 464 (from *Ficus carnosa*, Madeira).
1910. *Leptothrips longitubus*, Bagnall, *l. c.* liv. p. 464 (rectification of generic position).

I have long been aware of the identity of the Madeiran *Leptothrips flavicornis* and the Javanese *L. longitubus* with Marchal's *Phlœothrips ficorum* from Algeria, and I was surprised that the above were not included in Hood's lengthy list of synonyms in *Insecutor Inscitiæ Menstruus* (1912, i. p. 153). I was under the mistaken impression, however, that I had published a note on the synonymy, and now rectify the omission.

d. *Haplothrips* group.

Cephalothrips hispanicus, sp. n.

♀.—*Forma aptera*. Length 1·3 to 1·4 mm.

Grey-brown, head and first two antennal joints chestnut-brown; fore-femora yellowish at inner margin, fore-tibiæ yellow clouded with grey to grey-brown basally and along outer margin; intermediate and hind tibiæ shading to yellow distally; all tarsi yellowish with brown spot. Antennal joint 3 lemon-yellow, 4 to 6 yellowish to light brownish-yellow; 7 and 8 light brown.

Head about 1·3 times as long as wide across eyes, widest just below the middle; cheeks broadly arched; eyes slightly protruding, coarsely facetted, occupying about 0·35 the total length of head and each about 0·25 the breadth. Vertex raised; ocelli large, posterior pair on a line across the anterior third of eyes; anterior ocellus forwardly directed; postocular setæ short, inconspicuous. Antennæ about 1·7 times the length of head, rather stout; joint 3 obconical, narrower than 2 or 3 to 5, 6 and 7 somewhat broadly and 7 and 8 broadly united; relative lengths of segments approximately as follows:—8 : 15 : 14 : 15 : 16 : 15 : 12 : 8. Mouth-cone reaching about 0·7 across prosternum; apex blunt; joint 1 of maxillary palpus short, about 0·2 the length of 2.

Prothorax about 0·75 the length of head and about twice as broad as long. All setæ present, colourless and therefore difficult to discern; the pair at posterior angles largest, 0·4 the length of prothorax. Pterothorax slightly broader than width across fore-coxæ, about as long as broad; wings absent; legs rather short and stout; fore-tarsus with a minute, sharp, but broad-seated tooth.

Abdomen not much broader than pterothorax; elongate; roundly narrowed from segment 7 to base of tube. Tube about as long as the prothorax, 0·65 as broad at apex as at base, sides gently and evenly narrowed from near base; terminal hairs about as long as tube, colourless except for basal third or thereabouts. Abdominal setæ on segment 9 about 0·8 the length of tube, other setæ shorter; all colourless and inconspicuous. Wing-retaining setæ on tergites 2 to 7.

Separated from *C. monilicornis* (Reuter) by the smaller size, shape, and coloration of the antennæ, and the shape and modest or normal proportions of the head. It should be noted that the *Cephalothrips yuccæ* of Hinds cannot be regarded as congeneric with *monilicornis* or *hispanicus*.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. SPAIN, Zaragosa; 2 ♀s collected (with other interesting Thysanoptera) by the well-known neuropterist, Father Navas, S.J., 8. iv. 13.

Rhopalothrips froggatti, sp. n.

♂.—Length about 0·75 mm.

Apterous; short and broad.

Uniform brown, distal third of fore-tibiæ and extreme apices of intermediate and hind tibiæ yellowish-white; tarsi yellowish marked with brown; apex of antennal joint 2 and whole of 3 yellowish, 4 and 5 a trifle lighter brown than 6 to 8.

Head much as in *R. bicolor*, Hood, but with the outline of eyes merged in the cheeks; scarcely wider at base (where it is widest) than long; ocelli absent; postocular bristles short, broad apically, apparently infundibuliform. Antennæ short and stout, about 1·7 times as long as the head, shaped as in *R. bicolor*, but joint 6 distinctly constricted at base forming a short stem.

Prothorax transverse, 0·6 as long as the head, and 2·8 times as broad as long; all usual setæ apparently present, colourless, short, and infundibuliform. Pterothorax short, transverse, only slightly broader than the prothorax. Legs short and stout; fore-tarsal tooth strong, sharp.

Abdomen short and broad, narrowing evenly from segment 4 to tube; segments—especially 1 to 8—very strongly transverse; segment 4 about 7 times and 7 about 5 times as broad as long. Tube very short, broad, 0·5 the length of the head, about 0·8 as broad at base as long and 0·6 as broad at apex as at base; terminal hairs pointed, colourless, and about 0·6 the length of the tube. Abdominal setæ short, colourless, infundibuliform.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. AUSTRALIA, Upper Mangrove, N.S.W.; 1 ♂ and larvæ from glands on the foliage of the black wattle (*Acacia decurrens*), Sept. 7th, 1900 (*W. W. Froggatt*).

This, the smallest described species of the suborder, is one of an interesting collection of Tubuliferous Thysanoptera (chiefly Gall-causers) made by Mr. Froggatt, upon which we propose to publish a joint paper; and I have chosen to describe it now, firstly, that I may name it in Mr. Froggatt's honour, and, secondly, on account of its general interest in the light of Mr. Reginald Kelly's * recent paper "Observations on the Function of Acacia Leaf-glands," wherein he mentions that microscopic insects, some white (? larval) and others brown, are sometimes found in the so-called "glands."

R. froggatti, apart from its minuteness, may be distinguished by its very broad form, the broad intermediate antennal joints, the very short and broad prothorax and abdominal segments, and the short broad tube, &c.

Rhopalothrips brunneus, sp. n.

♀.—Length about 1·25 mm.

Apterous. Very like *R. froggatti*, larger and more slender. Dark black-brown, fore-tibiæ yellow near apex, other tibiæ and all tarsi as in *R. froggatti*. Antennæ with joint 3 yellow shaded with grey, 4 and 5 light brown, yellowish basally, and 6 with stem yellowish.

Head as in *P. froggatti*, about as wide as long; antennæ 1·8 times as long as the head, intermediate antennal joints not so broad compared to their length as in *froggatti*.

Prothorax 0·75 as long as the head and 2·25 times as broad as long.

Abdomen elongate, roundly narrowed from segment 7 to base of tube; segment 4 about 4·5 times and 7 about 3·8 times as broad as long. Tube about 0·75 the length of head, nearly twice as long as broad at base and about 0·5 as broad at apex as at base; terminal hairs pointed, a little more than 0·5 the length of the tube.

All setæ as in *froggatti*, but longer.

Type. Hope Department of Zoology, University Museum, Oxford.

Hab. AUSTRALIA, Victoria, on *Acacia dealbata*, 2 ♀s (*R. Kelly*).

Sharply distinguished from *froggatti* by its larger size, deeper colour, the coloration and more slender form of intermediate antennal joints, the less broad form, &c.

The coloration of both *froggatti* and *brunneus* distinguishes them from the genotype, *R. bicolor*, Hood.

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* Vict. Nat. xxx., Nov. 1913, pp. 121–127.

35

ON A NEW SPECIES OF *MELANOTHRIPS* (THYSANOPTERA) FROM TUNISIA.

BY

RICHARD S. BAGNALL, F.L.S.

(*Hope Department of Zoology, University Museum, Oxford.*)

Reprinted from " The Entomologist's Monthly Magazine," 2nd Series, Vol. xxiv.

MELANOTHRIPS NIGRICORNIS, sp. n.

This species is so closely related to *M. fuscus* (Sulz.) that a separate description is unnecessary. It is of a deeper brownish-black colour and has the antennæ unicolorous in both sexes. The colour of the fore-wings is also slightly darker than in *fuscus* and is continued to the extreme base.

The antennæ are more slender and the basal two-thirds of the outer margin of the third joint is distinctly sinuate; joint 4 is distinctly longer than either 3 or 6 in the ♂ as well as in the ♀, and 8 is not so noticeably shorter than 7 or 9 as in *fuscus*.

The spines on head, prothorax, wing-veins and tibia, are darker, apparently stronger, and more noticeable than in *fuscus*, and the hind tibia in both sexes is without the outstanding hairs on the outer margin near base, seen in *fuscus*.

Type: Hope Collections, University Museum, Oxford.

Hab.: Both sexes taken by Mr. P. A. Buxton in the flowers of a *Convolvulus* (? *C. tricolor*) at Djebel Achkel, N.E. Tunisia, 27–iii–1913. I detected this form in a collection submitted by Mr. Buxton to Mr. C. B. Williams, who has kindly made preparations of both sexes and allowed me to describe the species.

The following is a table of the known living species:—

1. Fore-wings with two broad white cross-bands, antennal joints 2—4 light yellow...*M. ficalbii*, Buffa—Italy (Buffa), England (R.S.B.)*

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* Journ. Econ. Biol., viii, Sept., 1913.

Fore-wings obscurely brown or yellowish-brown without cross-bands............. 2

2. Antennæ darker and slightly more slender; joint 3 concolorous with others, basal two-thirds of outer margin sinuate; joint 4 distinctly longer than 3 or 6 in both sexes, and 8 a little shorter than 7 or 9. Fore-wings unicolorous to extreme base. Hind tibiæ without outstanding hairs on outer margin near apex ....*M. nigricornis*, sp. nov.—Tunis.

Antennæ not so black; joint 3 yellow, outer margin not incurved; joints 3, 4 and 6 in ♂ practically subequal, and 8 in both sexes very noticeably shorter than 7 or 9. Fore-wing lighter in colour near extreme base. Hind tibiæ (in ♀ at least) with two long outstanding hairs on the outer margin near apex in addition to the usual short spines .... *M. fuscus* (Sulz.)—Europe, Tunis.

October 20th, 1913.

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Reprinted from " The Entomologist's Monthly Magazine," 2nd Series, Vol. xxiv.

ON TWO SPECIES OF *HAPLOTHRIPS* NEW TO THE BRITISH FAUNA.

BY

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(Hope Department of Zoology, University Museum, Oxford).

I am very pleased to be able to bring the following distinct and interesting species of *Haplothrips* forward as British, both from the neighbourhood of Oxford:—

HAPLOTHRIPS JUNCORUM, *sp. n.*

♀. Length, 2·1—2·35 mm.

Comes nearest to *H. aculeatus.*

Colour very deep brownish black: antennæ and legs as in *H. aculeatus.*

Head about 1·55 times as long as the prothorax and 1·35 as long as broad; slightly narrowed posteriorly. Antennæ only 1·35 times as long as the head. Posterior ocelli widely separated, practically touching inner margins of eyes; anterior ocellus forwardly directed. Postocular bristles weak. Mouth-cone blunt, reaching half-way across the prosternum. Prothorax 1·85 times as broad at hind angles as long. Wings clear, except for a slight touch of brown at extreme base; hind margin of fore-wing with 9—12 cilia (in one case only 7) duplicated near apex.

Abdomen long, not, or only very slightly, broader than pterothorax. Tube 0·9 the length of the prothorax, and 0·6 the length of the head. Apical bristles long and slender, as long as tube and almost colourless, except near tube where they are greyish. In *H. aculeatus* the apical bristles are wholly greyish-brown.

[The following table will help to show the distinguishing characters of the two species at a glance:—

Wings clear. Tube 0·6 the length of the head and only a little more than twice as long as broad at base:

1. Size smaller (length, 1·4—1·6 mm.). Head only slightly longer than broad; antennæ more than 1·5 times as long as the head. Fore-wings with 5—6 duplicated bristles...*H. aculeatus* (Fabr.).
2. Size larger (length, 2·1—2·35 mm.). Head 1·35 times as long as broad; antennæ only 1·35 times as long as the head. Fore-wings with 9—12 duplicated bristles ....*H. juncorum*, sp. n.]

The larva is red, with the head and antennæ, the prothoracic plates, the legs, the basal half of the 8th abdominal segment and segments 9 and 10 grey-brown, though not conspicuously so.

Hab.: Near Yarnton (Oxon.). Not uncommon in all stages on *Juncus* sp., June, 1913.

TYPE: In coll. Bagnall, University Museum, Oxford.

HAPLOTHRIPS DISTINGUENDUS (Uzel).

Monographie der Ordnung Thysanoptera, 1895, p. 239.

This species comes near to *H. statices*, and is sharply distinguished by having the 3rd antennal joint and the basal third of joints 4, 5, and 6 yellow.

The head is shorter, 1·1 times as long as broad, the wings are clear, and the tube about 0·75 the length of the head. In my specimen the 1st antennal joint is grey, and lighter than the second, whilst the tube is distinctly darker than the rest of the body, and the fore-tibiæ are yellow broadly shaded with grey at inner and outer margins. The hind margin of the fore-wing has 14 duplicated cilia near apex. My specimen is 2·2 mm. long, *i.e.*, distinctly larger than Uzel's type.

Hab.: Weston-on-the-Green (Oxon.), one example (♀) by beating sedge-stacks, August, 1913.

The minor differences noted above make it inadvisable to refer the species to *H. distinguendus* with certainty. A series of specimens would enable one to settle the point, and I am hopeful of meeting with it again. Sedge is evidently not its true pabulum.

September 6th, 1913.

November, 1913.

DESCRIPTIONS OF SOME NEW SPECIES OF BRITISH *THYSANOPTERA (TUBULIFERA).*

BY

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(*Hope Department of Zoology, University Museum, Oxford.*)

Reprinted from " The Entomologist's Monthly Magazine," 2nd Series, Vol. xxiv.

In the following notes I have pleasure in describing four new and interesting species of *Tubulifera.* Two of these fall into the genus *Hoplandrothrips*—a genus separated from *Phlœothrips, s. str.*, by the presence in the male of two small teeth at the tip of the fore-femur within, and—usually—a similar tooth near the base of the fore-tibiæ within. Representatives are known from Europe, North America, and Africa.

HAPLOTHRIPS OBSCURIPENNIS, *sp. n.*

♀. Length, 1·4 to 1·6 mm.

Comes nearest to *H. juncorum*, Bagn., and *H. aculeatus* (Fabr.).

Colour very deep brownish-black, as in *juncorum*; fore-tibia yellowish, shaded with dark grey-brown basally and along the upper and lower margins; intermediate and hind tibiæ lighter at extreme tips; all tarsi yellowish. Antennæ with third joint yellowish, shaded with grey apically, 4 and 5 grey-brown with basal third at least, yellow, somewhat sharply defined; 6 to 8 darker grey-brown, the sixth with basal fourth yellowish.

Head about 1·6 times as long as the prothorax and 1·15 times as long as broad. Cheeks slightly arched. Postocular bristles long. Mouth-cone not as long as broad at base, reaching half-way across prosternum; maxillary palpi long. Antennæ 1·6 times as long as the head; relative length of joints approximately:—8 : 15 : 16 : 16·5 : 16 : 15 : 14 : 11.

Prothorax strongly transverse, 2·25 times as broad across hind angles as long; prothoracic setæ long, especially the pair at posterior angles, pointed. Pterothorax slightly broader than prothorax, longer than broad. Wings light greyish-brown, cilia dark; fore-wing more markedly obscured from commencement of the marginal ciliation to beyond the middle; dark patch at base. Hind margin of fore-wing with 3–9 cilia duplicated near apex. Fore-tarsus with a minute tooth. Abdomen long, a little broader than the pterothorax. Tube about 0·6 times the length of head, twice as long as broad at base, gently narrowed apically with a slight and gradual constriction just before apex; apical bristles not quite as long as tube, dark basally but lighter apically. Lateral abdominal bristles yellow; moderately long, especially those on segments 7 to 9.

♂. Prothorax a little longer than in the ♀, and fore-legs slightly incrassate with each fore-tarsus furnished with a distinct tooth.

This species is separated from both *juncorum* and *aculeatus* by the coloration of the antennæ, the clouded fore-wings, the relatively longer prothoracic setæ, and the shorter and more transverse prothorax. From *juncorum* it further differs in its smaller size, the shorter head and relatively longer antennæ, and from *aculeatus* by its deeper coloration. Its habitat, too, is of a different character.

Type: In Hope Collections, University Museum, Oxford.

Hab.: Amongst dead branches, old pea and bean-sticks, &c. Several examples of both sexes at Hogley bog, near Cowley (Oxon); one ♀ at Balsall Common, Warwickshire, September, 1913. Also a single ♀ by general sweeping, near Enslow Bridge (Oxon), 21.ix.13. Both Mr. A. H. Hamm and Mr. Willoughby Ellis have assisted me in securing further examples after my discovery of the species.

HAPLOTHRIPS CEPHALOTES, *sp. n.*

Length about 1·2 mm.

General colour as in *H. aculeatus*, head deep blackish-brown; antennæ with 3rd joint yellowish-brown, and the 4th and 5th a lighter grey-brown (or yellowish-grey-brown) than the following; wings clear.

Head about 1·6 times as long as the prothorax, and 1·1 times as long as broad behind eyes. Cheeks gently rounded and converging strongly posteriorly, minutely spinose; vertex raised in form of hump with the anterior ocellus at apex, facing forwards. Eyes rather prominent, coarsely facetted; post-ocular bristles only moderately long Posterior ocelli almost touching inner margins of eyes on a line drawn below their anterior third. Antennæ set below vertex, about 1·5 times as long as the head; joint 3 distinctly shorter than 4, and narrower than 2, 4, and 5; 4 longer and broader than any of the others. Relative lengths of joints, approximately:—18 : 26 : 26 : 31 : 29 : 27 : 24 : 15. Mouth-cone not quite reaching across prosternum.

Prothorax about twice as broad as long, setæ almost as in *obscuripennis*. Fore tarsus slightly incrassate and armed with a short stout tooth in ♂. Tooth minute in ♀.

Tube about 0·65 times as long as the head, and nearly 2·5 times as long as broad at base; terminal bristles 1·2 times as long as the tube, dark. Lateral abdominal setæ as in *obscuripennis*; yellow.

In type of coloration this species closely resembles *H. aculeatus* though the head is usually noticeably darker than the rest of the body. It is sharply distinguished from *aculeatus* by its smaller size, the noticeably small 3rd and the broad 4th antennal joints, and the distinctly converging head. In the latter respect and in the small third antennal joint, as well as in its small size, *cephalotes* resembles the Japanese *H. oryzæ* (Matsumura), from which it may be readily distinguished by the coloration of the antennæ, the smaller 2nd antennal joint, and the longer head compared to the length of the prothorax.*

Type: In Hope Collections, University Museum, Oxford.

Hab.: Several in sedge stacks, Weston-on-the-Green, August and September, 1913.

(*To be concluded*).

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* *H. cephalotes* also approaches *H. graminis*, Hood, from which it is at once separated by its size, coloration of antennæ, much shorter and more strongly transverse prothorax, and the long prothoracic setæ. The head, too, is more noticeably convergent posteriorly than in *graminis*.

DESCRIPTIONS OF SOME NEW SPECIES OF BRITISH *THYSANOPTERA* (*TUBULIFERA*), WITH NOTES ON VARIOUS DESCRIBED FORMS.

BY RICHARD S. BAGNALL, F.L.S.

(*Hope Department of Zoology, University Museum, Oxford*).

(*Concluded from Vol.* xlix, *page* 266).

Reprinted from "The Entomologist's Monthly Magazine," 2nd Series, Vol. xxv.

HOPLANDROTHRIPS ELLISI, *sp. n.*[*]

Length 2·3 to 2·6 mm.

Colour dark grey-brown; fore-tibiæ yellow, shaded with brown basally and along edges; extreme apices of intermediate and hind tibiæ yellowish; all tarsi yellowish; basal half of tube darker than distal half. Antennal joints 1, 2, and

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[*] I find pleasure in naming this and the following species in honour of Mr H. Willoughby Ellis and Mr. J. Collins respectively.

8 concolorous with head; 3 light yellow with apical third touched with grey-brown; 4, 5, and 6 dark grey-brown with basal half, two-fifths and one-third respectively yellow; 7 with extreme base yellowish. Wings clear, except for a very faint smoky tinge about middle; cilia darker.

Head about 1·33 times as long as broad behind eyes, and 1·75 times as long as the prothorax. Cheeks with a few short spines, broadest behind eyes, gently arcuate and as broad before the collar-like thickening at base as across eyes. Eyes finely facetted; post-ocular bristles set well back, longer than eye and very slender. Ocelli fairly large, set on a slight prominence, the posterior pair somewhat close to the inner margins of eyes and on a line drawn through their centre; anterior one directed forwards and protected by a pair of setæ. Mouth-cone reaching about 0·7 way across prosternum.

Antennæ somewhat as in *H. bidens* (Bagn.), about 1·65 times as long as the head; joints 3 and 4 clavate, broader than any of the succeeding. Relative lengths of joints:—14 : 21 : 32 : 31 : 27 : 23 : 20 : 12:—3 sense-cones on 3, 4 on 4, and 2 on both 5 and 6.

Prothorax transverse, twice as broad across hind angles as long; all setæ present, long and blunt, the postero-marginal ones the longest, about 0·7 the median length of the prothorax. Pterothorax as long as broad, broader than width across fore-coxæ; sides of metathorax narrowing to abdomen. Legs somewhat short and stout. Fore-femur strongly incrassate, with a pair of moderately large teeth at apex within; fore-tibia stout and only about 0·6 the length of the femur, apex obliquely produced and inner margin set with a broad-based tooth at about basal third; tarsal tooth long and stout. Fore-coxa with one long blunt hair and several short stout spines. Wings reaching to about 7th abdominal segment, not constricted near middle; cilia long and not very closely spaced, duplicated.

Tube 0·6 the length of head, about 2·2 times as long as broad at base, and about 0·5 as broad at apex as at base; terminal hairs slender, colourless except at base, and a little longer than tube. Bristles on 9th segment not quite as long as tube; tergite with a pair of spine-like setæ near posterior angles, about 0·33 the length of tube. Lateral abdominal bristles on segments 2 to 8 yellowish, with the exception of one pair, blunt or "knobbed," longest on 7 and 8.

♀. A little larger, fore-legs less strongly incrassate and without the femoral and tibial teeth; genal spines more numerous but more minute and therefore less obvious. Post-ocular and prothoracic bristles apparently slightly shorter; pair of spine-like setæ on 9th abdominal tergite absent.

Type: In Hope Collections, University Museum, Oxford.

Hab.: Several ♂ ♂ and one ♀ (slightly immature) taken by beating dead branches, etc., at Balsall Common, Warwickshire, with *Phlœothrips coriaceus*, September, 1913. I owe a nice series largely to

Mr. Willoughby Ellis's energetic assistance—the species was distinctly rare and difficult to get. One ♀ obtained by beating a dead sallow branch near Kirtlington Park (Oxon), 21.ix.13, is apparently referable to this species.

HOPLANDROTHRIPS COLLINSI, *sp. n.*

Length about 1·5 mm.

Colour almost as in *H. ellisi*; antennal joints 6 to 8 wholly dark brown, 3 yellow, brown distally, 4 with basal third and 5 basally yellow or yellowish brown; basal joints greyish near base.

Head only 1·1 times as long as broad, slightly converging posteriorly, genal spines minute. Mouth-cone almost reaching across prosternum. Antennæ 1·7 times as long as head; relative lengths of joints:—12 : 17 : 30 : 27 : 23 : 22 : 18 : 14; 3 and 4 clavate, broader than any of the others; 5 broadly clavate, broader than 6 to 8.

Prothorax and setæ about as in *H. ellisi*. Pterothorax a little broader than long; sides of metathorax converging to abdomen. Hind-legs comparatively a little longer than in *H. ellisi*; fore-legs only moderately crassate, with the pair of teeth near apex of femur within smaller than in *H. ellisi*; tibiæ longer and more slender, without tooth at basal third within; tarsal tooth somewhat short, sharp. Coxæ as in *H. ellisi*. Wings as in *H. ellisi*, 10 cilia duplicated.

Tube 0·6 the length of head; terminal hairs, bristles of 9th segment and lateral abdominal setæ as in *H. ellisi*.

Readily separated from *H. ellisi* by its smaller size, shorter and relatively broader head, and the coloration of the antennæ.

Type: In Hope Collections, University Museum, Oxford.

Hab.: One ♂ taken with *H. ellisi*, Balsall Common, Warwickshire; and another ♂ by beating dead ash branches, Enslow Bridge (Oxon), September, 1913.

The genus *Hoplandrothrips* is apparently composed of numerous somewhat closely allied forms and is known from Europe, Africa, and North America.

The European species *Phlœothrips annulipes*, Reut. (Finland); *minor*, Uzel; *parvus*, Uzel (Bohemia); *brevicollis*, Bagn. (Norway); and *albovittatus*, Schille (Poland), are known from females only, and it is probable that some or all of them should be referred to *Hoplandrothrips*. Of these, *albovittatus* is distinctive on account of the coloration of the prothorax, whilst *annulipes*, *parvus*, *brevicollis*, and *Hoplandrothrips bidens*, Bagn. (Hungary), are separated at once from the species just described by having the intermediate and hind tibiæ yellowish both basally and apically. *P. minor* has the head only slightly broader than long as in *collinsi*, but the coloration of the antennæ is distinctive, the 5th antennal joint is fusiform, and the tube is nearly as long as the head.

Of the American species, *xanthopus*, Hood, *insolens*, Hood, *uzeli*, Hinds, have the tibiæ yellow; *funebris*, Hood, has the antennæ uniformly brown; *juniperinum*, Hood (somewhat near *collinsi*), has minute prothoracic setæ; and *microps*, Hood, has a peculiarly shaped head with distinctive chætotaxy. *Jennei*, Jones, and *armiger*, Jones, have the innermost pair of bristles on the 9th tergite knobbed, and the antennæ coloured somewhat as in *minor*. *Pergandei*, Hinds, is very near *collinsi*, but has the base of the 6th antennal joint yellow, the pterothorax narrower, and the 5th antennal joint apparently fusiform, whilst *raptor*, Crawford, is not unlike *ellisi*, differing in the shape of the head, the coloration of the antennæ, and in the postero-marginal setæ of the prothorax, which are much shorter than those at posterior angles.

Of the two described African species, *hoodi*, Bagn., is a very distinctive one; *natalensis*, Tryb., is near *collinsi*, differing in its coloration, relative lengths of antennal joints, chætotaxy of abdomen, etc.

CRYPTOTHRIPS LATUS, Uzel.

One example and larvæ taken by Mr. Wm. Harvey at Bournemouth, January, 1913. Several examples and larvæ amongst dead branches and old bean sticks, Hogley Bog, near Cowley (Oxon), September, 1913, with an undescribed *Haplothrips*. Previously known as British from a single specimen, without data, in the British Museum.

CRYPTOTHRIPS MAJOR, Bagnall.

Described from a single Norwegian example, Mr. C. B. Williams has had the good fortune of discovering both sexes and larvæ in Surrey and is bringing forward the species.* I have taken larvæ that agree well with those submitted to me by Williams in Oxfordshire and Warwickshire, and possess a single ♂ taken by Mr. J. Collins at Water Eaton (Oxon) in August, 1913.

CEPHALOTHRIPS MONILICORNIS (Reut.).

Several wingless examples on grass from the Ruskin Reserve, Cothill (Berks), September, 1913.

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* Journ. Econ. Biol., December, 1913.

TRICHOTHRIPS SEMICÆCUS, Uzel.

One example from under bark of willow on the banks of the Cherwell, near Oxford, February, 1913.

PHLŒOTHRIPS CORIACEUS, Hal.

With an undescribed *Hoplandrothrips*, by beating dead branches, Balsall Common, Warwickshire, September, 1913 (H. Willoughby Ellis and R. S. B.).

HOODIA BAGNALLI, Karny.

Numerous larvæ and one imago on wych elm, Abingdon; larvæ on wych elm and ash, Cothill (Berks), September. Larvæ on ash at Enslow Bridge and Water Eaton (Oxon), October, 1913.

Oldstead, Park Town,
Oxford: *December 9th*, 1913.

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Reprinted from "The Entomologist's Monthly Magazine," 2nd Series, Vol. xxv.

EUTHRIPS TAMICOLA, A NEW SPECIES OF *THYSANOPTERA* FROM THE FLOWERS OF THE BLACK BRYONY.

BY RICHARD S. BAGNALL, F.L.S., F.E.S.

One afternoon towards the end of June I found an ordinary looking black Thrips, with a white band at the base of wings, in some numbers, in the minute flowers of the Black Bryony (*Tamus communis*) in the hedge-side near Yarnton, Oxon. I did not attach much importance to this capture, but upon examination on my return home it turned out to be a new and distinct species of *Euthrips* (*Anaphothrips*), which I describe below. The following evening I cycled along several country roads and lanes in the neighbourhood of Oxford (in the two counties) and took the same Thrips in the flowers wherever the plant was found.

EUTHRIPS TAMICOLA, n. sp.

This species belongs to the section in which the sixth antennal joint is not divided.

♀. Length, 1.4 to 1.5 mm.

Colour, deep blackish brown, all tibiæ and tarsi yellow. Second antennal joint yellowish distally, 3 and 4 yellowish and 5 greyish-brown with the base yellow. Upper wings grey-brown, basal fifth (or thereabouts) white; mid-vein of hind-wings and all cilia fumose.

Head broader than long, 0.7 as long as broad, diverging basally; su irregularly and transversely striate, sparingly setose. Eyes somewhat r ent, occupying about 0.5 the total length of the head, coarsely face minutely and sparingly pilose. Ocelli on a prominence, large wit tinge; posterior pair about on a line through middle of eyes. Anten 2.2 times the length of the head, 6th joint entire; relative lengths approximately—5 : 12 : 20 (including stem) : 17 : 13 : 18 : 3 : 5. Join cellate, roughly fusiform; 4 moderately clavate, 5 and 6 somewhat broadly united: 3 and 4 with long, slender double trichomes, and 6 with a long, slender, single trichome near outer side of apex.

Prothorax transverse, angles rounded, about 0.6 as long as broad; surface irregularly transversely striate, minutely and sparingly setose; about 0.9 the length of the head.

Pterothorax a little longer than broad, sides of metathorax narrowing towards the base of the abdomen. Legs moderately long, tibiæ somewhat more than usually stout. Wings fully developed, reaching to the eighth abdominal segment; setæ minute, lower vein of fore-wing more or less regularly set, 17 or more to distal fifth; upper vein with four or five near base, 1 near middle, 1 about distal fourth, and 1 at extreme apex; costa similarly set with similar weak setæ. Lower cilia of fore-wing wavy, those of hind-wing rather sparse.

Abdomen elongate-oval, slightly broader than the pterothorax and about 0.6 the length of the entire insect, rapidly narrowing from base of segment 8 to tip; spines on 9 longer than, and on 10 as long as, the 10th segment, which is open above.

Type: In Hope Department of Zoology, University Museum, Oxford.

Habitat: In numbers with its pink larvæ, in the flowers of the Black Bryony *(Tamus communis)*, Yarnton and Cowley (Oxon), and North Hincksey, Boar's Hill and neighbourhood (Berks), June, 1914. Probably a widely-distributed species.

Hylton, near Sunderland:
October 5th, 1914.

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[*Extracted from the* Geological Magazine, Decade VI, Vol. I,
No. 605, pp. 483–5, November, 1914.]

Fossil Insect in Amber.

On *Stenurothrips succineus*, gen. et sp. nov., an interesting Tertiary Thysanopteron.

By Richard S. Bagnall, F.L.S., F.E.S.

(PLATE XXXVI.)

The thrips described herein was submitted to me by Professor Branca of the Geologisch-Palaeontologisches Museum, Berlin, and is one of a small collection of three examples in Baltic Amber. The genus is curious on account of the abnormal tube-like development of the tenth abdominal segment, which, however, is open ventrally for its entire length. In the form of the antennæ, so far as can be ascertained from the single example and the structure of the wings, *Stenurothrips* would seem to show affinity with the Neotropical genus *Heterothrips*, and for the present I regard the genus as falling in the Heterothripidæ.

In the generic description I have stated that there is a cross-vein connecting the two longitudinal veins of the fore-wing near the basal third. In this example I *think* I can discern this cross-vein, which is shown somewhat markedly in the figure, but it is open to some doubt. In another species of the same genus now before me, and chiefly separated from the present species by the more minute spines of the fore-wing, the wings are spread out, and this cross-vein is distinctly discernible.

Whilst I have been able, by various lighting arrangements, to obtain a close detailed report of the upper surface, it has been impossible to make out the mouth-parts, the legs, which are tucked under the body, the basal part of tube ventrally, etc., on account of a thick milky cloudiness, which, in a lesser degree, also somewhat obscures the dorsal surface of the abdominal segments 8, 9, and base of 10, so that it is impossible to describe the arrangement of bristles, shown in the figure as springing from segment 9 with absolute accuracy. The angle of the antennæ makes it impossible to gauge the relative lengths of segments.

Order THYSANOPTERA.

Sub-order TEREBRANTIA.

Family HETEROTHRIPIDÆ, Bagnall.

Genus STENUROTHRIPS, nov.

♀ Head transverse, about as long as prothorax. Antennæ nine-jointed, the first four joints stouter than the succeeding five.

Prothorax transverse, two prominent bristles at each hind angle; mid-lateral pair well developed. Pterothorax well developed. Wings long, fore-wing with two longitudinal veins each uniting with the ring-vein near apex; apparently a cross-vein uniting the longitudinal veins near basal third. Costa and both veins set for whole length with setæ.

Abdomen elongate-ovate, with tenth segment abnormally produced, very elongate, cylindrical, open ventrally for entire length, and longer than the length of head and prothorax together. Segment 9 furnished with long bristles, and 10 with a series of setæ before apex. Ovipositor presumably long and straight.

Type: *Stenurothrips succineus*, mihi.

Of living Thysanoptera this form undoubtedly comes near *Heterothrips*, a Neotropical genus, but is strikingly distinguished by the abnormal development of the tenth abdominal segment, the tubiform appearance suggesting a Tubuliferon.

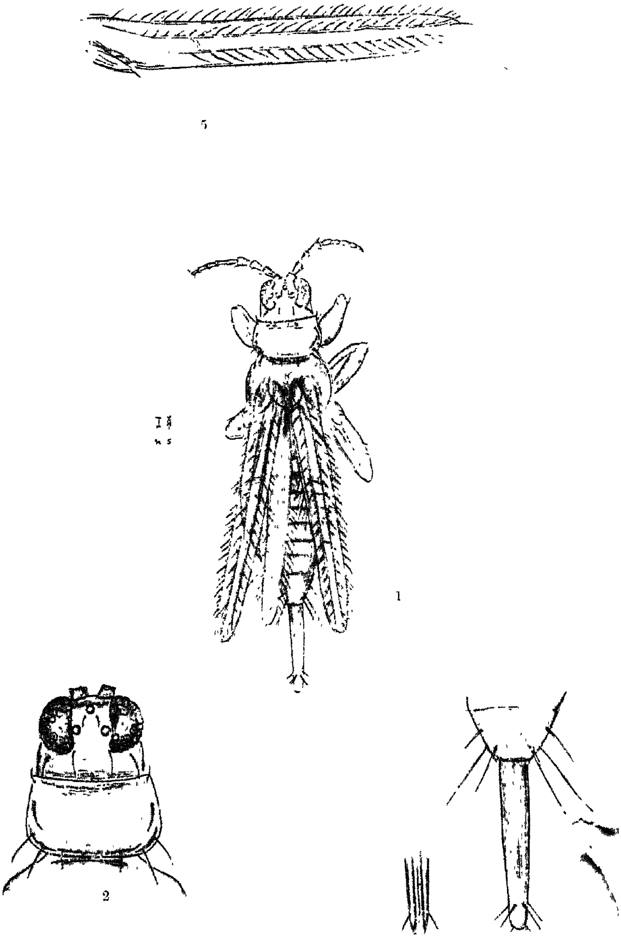
We have noticed several forms distinguished by a similar development, notably *Panchætothrips*, a Heliothripid-like form, distinguished by the form of the explanate margins of abdomen and produced pleurites, and the tube-like tenth abdominal segment, in which there is exhibited a tendency for the ventral opening to close. In this form the ovipositor is styliform and but poorly developed. In *Dinurothrips*, Hood, and *Macrurothrips*, Vuillet, the tenth segment is also strikingly developed.

STENUROTHRIPS SUCCINEUS, sp. nov.

Length about 1·8 mm., breadth of mesothorax 0·35 mm., length of tenth abdominal segment about 0·35 mm.

Head transverse, about 0·75 as long as broad, and as long as or a little longer than the prothorax. Cheeks sub-parallel, dorsal surface near base faintly striate. Eyes large, moderately closely facetted and apparently pilose; greatest dorsal length equal to about 0·75 the total length of head, and space between eyes about 0·4 the greatest width across them. Ocelli moderately large, well separated, posterior ones close to the inner margin of eyes; a pair of minute [illegible] setæ present. Two pairs of rather long backwardly [illegible] setæ on a line behind eyes, practically equidistant, the directed

Geol. Mag., 1914. Plate XXXVI



R. S. Bagnall del.
Bale, Sons & Danielsson Ltd., Imp.

STENUROTHRIPS SUCCINEUS *gen. et sp. nov.*
From Baltic Amber.

inner pair being on a slightly higher plane, one near hind angle of each eye. Antennæ nine-jointed, the breadth of the first four joints, which are finely ringed, being noticeably greater than any of the succeeding and 2–4 sub-equal; joints 5–7 fusiform and apparently sub-equal in length.

Prothorax transverse, nearly twice as broad across posterior third as long through middle; anterior angles obtuse, the hind angles broadly rounded. Surface, anteriorly at least, faintly transversely striate. Each hind angle furnished with two long bristles, about 0·6 the length of the prothorax; a mid-lateral pair backwardly (and slightly inwardly) directed and about 0·45 the length of the prothorax. A series of at least two pairs of postero-marginal setæ.

Pterothorax well developed, much broader than prothorax but not quite as broad as the abdomen at broadest. Wings long, about ten times as long as broad near middle, reaching to about the middle of the tenth abdominal segment, apically somewhat pointed; two distinct longitudinal veins running for the entire length of fore-wing, apparently connected by a cross-vein at about the basal third, and each uniting with the ring-vein near tip. Costa and longitudinal veins uniformly set with moderately long stout setæ, the costa with approximately 45, upper vein 23, and the lower vein 18; a single seta set near apex of wing, just beyond fore-vein but not on it. Setæ as long as or longer than 0·35, the breadth of wing near middle.

Abdomen — excluding segment 10 — elongate-ovate, the ninth segment narrowing to base of 10, which latter is exceptionally elongated, a little longer than the length of the head and prothorax together; ventrally open for its entire length and furnished with a series of setæ just before apex. Ninth segment furnished with four postero-marginal bristles, of which the outer pair is apparently longer than the inner and about 0·5 the length of the tenth segment; also furnished with another and shorter dorsal, dorso-lateral, or lateral pair on a higher plane.

EXPLANATION OF PLATE XXXVI.

FIG. 1. *Stenurothrips succineus*, gen. et sp. nov. × 35.
,, 2. ,, ,, Head and prothorax. × *c.* 70.
,, 3. ,, ,, Ninth and tenth abdominal segments. × 70.
,, 4. ,, ,, Underside of tip of tenth abdominal segment. × 70.
,, 5. ,, ,, Right fore-wing. × *c.* 50.

Formation and locality: from Tertiary Lignite Deposits, shores of the Baltic, extending from Dantzig to Memel, etc.

Stephen Austin and Sons, Ltd., Printers, Hertford.

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Brit. Assoc., 1913.

p. 531.

2. *A Chalcid Parasitic on Thrips* (Thysanoptera).

By Richard S. Bagnall, *F.L.S.*

For some time now Thrips have been regarded as insects of considerable economic importance, and on that account have formed the subject of considerable research. Yet it was only in 1911 that a parasite of any importance was discovered, when Mr. H. M. Russell reared a Hymenopterous insect belonging to the Chalcidæ from the prepupa of *Heliothrips fasciatus* Pergande, which Mr. J. C. Crawford has described as a new genus and species, *Thripoctenus russelli.*

Mr. Russell last year published the results of numerous experiments carried out on this parasite, showing that it reproduces parthenogenetically and would oviposit in the larvæ of several species of Thrips belonging to the sub-order Terebrantia such as *Thrips tabaci, Frankliniella tritici*, but would not attempt oviposition in the larvæ of a species belonging to the sub-order Tubulifera, and also refused to oviposit in the young of a bug and of Aphides.

In the same year (1911) G. del Guercio reported upon a Chalcid parasite of a species of Tubulifera, the Olive Thrips (*Phlœothrips oleæ* Costa), which in a later paper he named *Tetrastichus gentilii*, stating that both sexes occurred.

With these exceptions only one other Thrips parasite has been named, when, in 1860, Mrs. Charlotte Taylor described one from Thrips on wheat, under the name of *Pezomachus thripites*, a small, wingless creature, with multi-articulate antennæ and two thoracic nodes. This has not since been recognised.

For some time I have observed a minute black and white Chalcid parasite which I have always regarded as having some connection with Terebrantian Thysanoptera. In August of this year (1913) I found many specimens of this Chalcid in the flowers of the toad-flax (*Linaria*) at Hele Bay, near Ilfracombe, which were obviously interested in Thrips larvæ (*Tæniothrips primulæ* chiefly, and *Physothrips atratus*), and the following morning, by a curious coincidence, I received a long-promised tube of *Thripoctenus russelli* from Mr. Russell. An examination of my captures showed that they belonged to the genus *Thripoctenus*, and almost certainly to the American species, *russelli*, though I propose submitting it to the describer, Mr. Crawford.

British distribution of *Thripoctenus russelli*: August 1913, with *Tæniothrips primulæ* and *Physothrips atratus* in toad-flax (*Linaria*), Hele Bay, near Ilfracombe; with *Oxythrips parviceps* and *Physothrips ericæ* in heather on the Tors, near Ilfracombe, and with *Thrips tabaci, Frankliniella intonsa* and *Thrips palustris* in the louse-wort (*Pedicularia palustris*) at Hogley Bog, Cowley, near Oxford.

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3. *On the Systematic Position of the Order* Protura.

p. 531.

By Richard S. Bagnall, *F.L.S.*

The Order *Protura*, diagnosed by Silvestri in 1907 and monographed by Berlese two years later, on account of its anomalous nature and curious morphological features, has formed the subject of many discourses as to its position in the Arthropod classification.

The important and essential characteristics were reviewed and the views of various authors discussed as to its relationship with the Myriapoda and *Insecta*. The reader deplored the use of the term *Myriapoda* to represent what was not a class but a convenient assemblage of 'many-legged' arthropods, and restricted his remarks to the one so-called Myriapod Order, *Chilopoda*, or Centipedes, highly organised Arthropods coming near to the *Insecta*. He considered that whilst the *Protura* had affinities with the *Chilopoda*, especially *Lithobius*, in the larger number of body-segments and the position of the genital opening, the weight of evidence lay in favour of modifying the classification of the insect, dividing it into two sub-classes, the one to include *Protura*, and the other to include all other Orders of insects.

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SOME INTERESTING BRITISH INSECTS (V).[*]

BY

F. W. L. SLADEN, F.E.S., R. S. BAGNALL, F.L.S.,

AND

J. E. COLLIN, F.E.S.

The two plates accompanying this article illustrate one species of *Hymenoptera*, two *Thysanoptera*, one *Proturon*, and seven *Diptera*.

Plate II.

Figs. 1, 2.—*Psithyrus distinctus*, Perez (1 ♂, 2 ♀, × 1½). This is an interesting British bumble-bee because, so far as the writer knows, no description of it has been published in England, except that given recently in " The Humble-bee."[†] The insect was, however, well known to Edward Saunders in his later years, who regarded it as a variety of *P. vestalis* to which, indeed, it is closely related.

The males of the two forms differ in the quality and colour of their coats: in *distinctus* the hairs are less equal in length, and the yellow is paler and more extensive. They may also be easily separated by the structure of the antennæ: the 5th joint in *vestalis* is about as long as, but in *distinctus* much shorter than, the 3rd and the 4th joints taken together; in *vestalis* the flagellum is about 6 mm. long, in *distinctus* it is only about 5 mm. long.

The female of *distinctus* is somewhat smaller than normal-sized females of *vestalis*, and has the yellow band on the anterior part of the thorax and the yellow on the sides of the 3rd abdominal segment paler than in *vestalis*. The yellow thoracic band is never reduced by melanism as it often is in *vestalis*.

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[*] *cf.* (I) Ent. Mo. Mag. XLV, pp. 196, 197, pl. III (1909) ; (II) XLVI, pp. 1-3, pl. I (1910); (III) XLVII, pp. 203–206, pl. III (1911).

[†] " The Humble-bee," by F. W. L. Sladen, 1912 (London, Macmillan & Co., Ltd.), pages 210-113.

Ps. distinctus has been taken by the Rev. F. D. Morice at Rugby, and by myself at Colinton, near Edinburgh. The specimens figured were bred at Dover in a nest of *Bombus lucorum* from a female sent me by Mr. H. L. Orr from the neighbourhood of Belfast. *Ps. distinctus* is probably a fairly common insect in many places in the north of England, in Scotland, and the north of Ireland, and it is probably parasitic on *Bombus lucorum*, which it resembles in the quality and yellow tint of the coat. I have taken only one specimen, a giant male, at Dover. *Ps. vestalis*, on the other hand, is parasitic on *B. terrestris* and resembles the latter in the quality and yellow tint of the coat, and seems to be abundant in the south and east of England, and to disappear altogether in the north.—F. W. L. S.

Fig. 3.—*Trichothrips longisetis*, Bagnall (× 20, drawn from the unique specimen [type] mounted in balsam).

The smallest British species of *Trichothrips*, which in the form of its mouth "cone" occupies with *T. cæspitis*, Uzel, a main division of the genus that may ultimately be treated as distinct.

The single specimen was taken in moss, Gibside, Co. Durham. Another species allied to the polyporus-feeding *T. pedicularis*, viz., *T. propinquus*, Bagn., from the Derwent Valley, was described in the same paper.* Further examples of *T. propinquus* have been taken both in the Derwent Valley and in a wood near Edinburgh, occurring under *Corticium* growing on old beeches. It has not been found in *Polystictus versicolor*, which is the polyporus usually frequented by *T. pedicularius*.—R. S. B.

Figs. 4, 5.—*Megathrips nobilis*, Bagnall (4 ♂, 5 ♀, × 12. Drawn from brachypterous carded specimens). This species was described in 1909 (Ent. Mo. Mag., XLV, pp. 130, 131) from brachypterous specimens of both sexes taken by Dr. Sharp in April and May, 1896, in dried sedge refuse, Wicken Fen, together with its larvæ, and also with larvæ and imagines of a recently recorded British species, *Cryptothrips dentipes*, Reut. The macropterous female of *M. nobilis* was taken in 1910 by Mr. Donisthorpe, whilst Mr. C. B. Williams, who is studying the group, last year found this species in the same habitat together with a distinct and interesting new *Euthrips (Anaphothrips)*.

This year it has been sent me by Mr. C. J. C. Pool from the same locality.

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* Trans. Nat. Hist. Soc. Nd. and D'ham, *n.s.* iii, pt. 3, December 1910.

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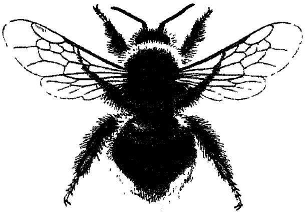

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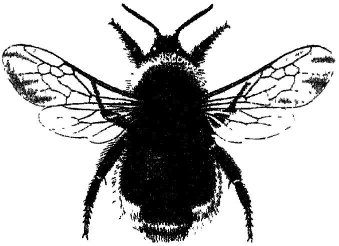

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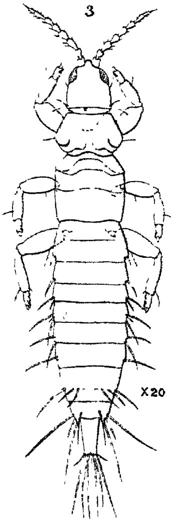

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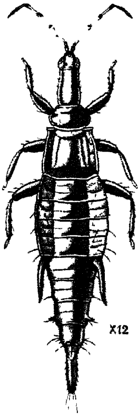

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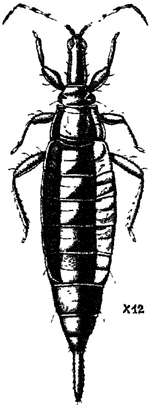

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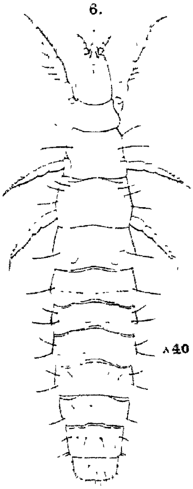

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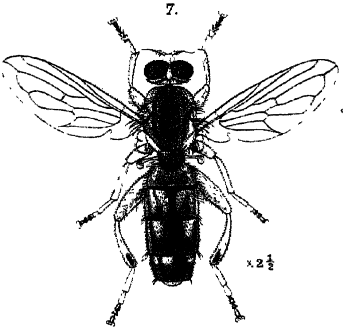

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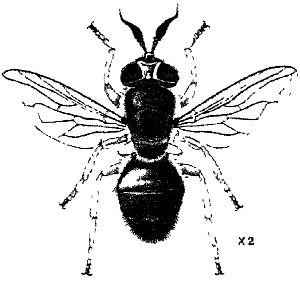

H. Knight and E. Wilson, del. Fa. Trap. Leiden, lith.

SOME INTERESTING BRITISH INSECTS.

M. nobilis shares with *M. bonannii*, Uzel, the honour of being the largest known European species of *Thrips*, and is recognized by the shape of the head, the shorter tube in the female, and the lateral processes of the 8th abdominal segment (absent in *M. bonannii*) in the male.

Another species of *Megathrips* (*M. lativentris*, Heeger) was taken by Dr. Randell Jackson in Delamere Forest in June, 1907.—R. S. B.

Fig. 6.—*Acerentomon affine*, Bagnall (× 40, rough outline sketch).

This species, which is the largest I have seen, belongs to the family *Acerentomidæ* of the recently diagnosed Order *Protura*, Silvestri (*Myrientomata*, Berlese), an Order of wingless insects without antennæ! It is closely allied to the type of the Order, *A. doderoi*, Silvestri, but Silvestri says that it cannot be referred to his species. I have therefore proposed the name *affine* for it. It occurs in large numbers (I have taken 400 examples) in Gibside, amongst frass under bark of beech, and is also found in the Wear Valley

Members of this Order are really not uncommon in our Islands. I have collected a good deal of material from the North of England, the Forth area, and the neigbourhood of Dundee—comprising several specimens representing the two families and three genera diagnosed by Berlese – and hope to deal with the British species shortly.

For further data see my paper [" Some Primitive British Insects. I.—The Protura "] published in " Knowledge," XXXV, pp. 215, 216, in June, 1912.—R. S. B.

Fig. 7.—*Hammerschmidtia ferruginea*, Fallen. The first record of the occurrence of this species in Scotland appeared on p. 191 of this Magazine for 1912. It is a widely distributed, but distinctly rare, northern insect which has been found in Scandinavia and the mountains of Central Europe, and recorded by Loew as occurring in Manitoba (Canada), and by Williston from the Washington Territory (U.S.A.).—J. E. C.

Fig. 8.—*Callicera yerburyi*, Verrall. Since Colonel Yerbury took the original four specimens at Nethy Bridge (Inverness-shire) in 1904 (v. p. 229 of this Magazine for that year), a few more have fallen to his net in subsequent visits, but the carefully sought for male has so far eluded capture.—J. E. C.

PLATE III.

Fig. 1.—*Lophosia fasciata*, Meigen. This very distinct Tachinid

was first recorded as British by Mr. F. C. Adams in this Magazine for 1901, p. 212, from three specimens taken at Lyndhurst (Hants) on July 22nd—24th, and August 1st, 1901; while curiously enough on July 24th of the same year Col. Yerbury caught an example at Parknasilla (Ireland). Since then the species has been taken by the late Mr. Verrall and myself at Wormsley Park (Oxon) in August, 1907; another specimen being found at the same locality by Mr. C. J. Wainwright in August, 1912. It is distinctly rare even on the Continent.—J. E. C.

Fig. 2.—*Chironomus fascipennis*, Zetterstedt. This very little known and pretty species is an addition to the British List, and was found flying over a small piece of ornamental water in the late Mr. Verrall's garden at Newmarket, on August 31st, 1910, and again on August 28th, 1912. It is allied to *C. flexilis*, Wlk., but easily distinguished by the extensively clouded tip of the wing, the sharply defined blackened base of the anterior tibiæ, and the pale middle part of the hind tibiæ.—J. E. C.

Fig. 3.—*Platyphora lubbocki*, Verrall. This species was originally described in 1877 from a specimen bred by Lord Avebury (Sir John Lubbock) from an ant's nest. Since then I believe Mr. J. J. F. X. King has taken it in the New Forest, while the present figure was made from an example found by Dr. J. H. Wood in Herefordshire. A second species, *P. pyrenaica*, Becker, was quite recently (Wien. Ent. Zeit., 1912, p. 330) described from the Pyrenees under the generic name *Psalidesma*. It should be noted that in the figure the minute bristles on the second thick vein are made very much too conspicuous.—J. E. C.

Fig. 4.—*Anthomyza bifasciata*, Wood. This insect was described in the Ent. Mo. Mag. for February, 1911, p. 40, and this is the only record of its occurrence.—J. E. C.

Fig. 5.—*Conops* (*Brachyglossum*) *signata*, Wiedemann. The first and only record of this species as British is that of Mr. J. Collins, who found a pair on September 11th, 1910, in Tubney Wood, near Oxford, as recorded on p. 273 of this Magazine for that year. According to Rondani it is to be found near the nests of *Vespa vulgaris*.—J. E. C.

[Reprinted from *The Entomologist's Record*, Vol. XXV., No. 9.]

Review of Field Work in 1911.

By RICHARD S. BAGNALL, F.L.S., F.E.S. (*Hope Department of Zoology, University Museum, Oxford*).

During the year 1911 my opportunities for field-work and entomological study were few, and yet the results were more than satisfactory.

As President of the field section of the Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne, I made a point of not only attending each meeting—sometimes at considerable inconvenience—but of devoting such time as I could to one group of Arthropods, of which little was previously known as regards the local (and indeed the British) fauna and distribution. Happily, I chose the Myriopods, partly on account of the interesting features—so suggestive of *Campodea*—seen in *Scolopendrella*, of which I gathered some hundreds of specimens.

With the exception of a few hours in the New Forest and at Blackgang Chine in the Isle of Wight on the occasion of the British Association Meeting at Portsmouth, my collecting outside field meetings was practically confined to the immediate vicinity of my late home in Penshaw, Co. Durham.

In my Presidential Report to the Society I remarked that altogether the year had been an extraordinarily fruitful one, the additions to the local fauna numbering somewhere between two and three hundred, and the additions to the British fauna being summarised as follows:—One order (PROTURA, Silvestri), four families (*Acerentomidae*, Silv., and *Eosentomidae*, Berlese, in the *Protura*, *Brachypauropodidae*, Hansen in the *Pauropoda*, and *Brachychaeteumidae* (nov.), Verhoeff, in the *Diplopoda*, several genera, and about sixty species, of which thirteen or fourteen were new to science.

It may prove interesting to make a brief resumé of these captures.

Myriopoda.—The Myriopods, of which over sixty local species were met with, may be taken in their four divisions, the main additions being made by a special study of the small creatures comprising the orders *Pauropoda* and *Symphyla*.

PAUROPODA.—For a long time the two species described by the late Lord Avebury remained alone as British. We now know six in the North, of which *Brachypauropus lubbocki*, Bagnall*, is the first British representative of the *Brachypauropodidae*.

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* *Trans. Nat. Hist. Soc. of Northumberland, Durham and Newcastle*, n.s., vol. iv., pp. 59-60, 1911.

SYMPHYLA.—The classical *Scutigerella* (*Scolopendrella*) *immaculata* of Newport remained until recently the sole representative of its kind in this country. In my synopsis* I am able to bring forward thirteen species, many of which have since been found in other localities. *Scutigerella spinipes*, Bagn., *S. biscutata*, Bagn., *S. hauseni*, Bagn., *Scolopendrella dunelmensis*, Bagn., *S. horrida*, Bagn., *S. delicatula*, Bagn., and *S. minutissima*, Bagn., are described as new.

DIPLOPODA.—I was particularly fortunate in stumbling across several interesting species of Millipedes proper, the additions (not a few of them quite conspicuous creatures) to the British list being as follows:—*Brachychaeteuma bagnalli* (gen. et sp. nov.), Verhoeff, from Gibside, a blind "square-backed millepede," which Verhoeff makes the type of a new family†; the little white Polydesmid, *Titanosoma jurassicum*†, Verh., in numbers from a Wear Valley dene, and sparingly from other parts of the country; *Polydesmus coriaceus*, Porat, from Moles' nests, County Durham; *Microchordeuma* sp. (? *silvestre*), from Gibside; *Isobates varicornis*, C.L.K., from Durham and Northumberland; *Napoiulus* sp. (? *palmatus*, Némec), from a Wear Valley dene, with *Titanosoma*, and the little prettily-marked var. *perplexa* of *Glomeris marginata* from Gibside and Teesdale‡. *Titanosoma jurassicum* was previously only known from a single ♀ found on the Danube, in 1910; it would seem to be parthenogenetic.

CHILOPODA.—Two specimens of *Lithobius* from Gibside were identified by Mr. Edv. Ellingsen of Kragerö, with some hesitation as *L. nigrifrons*, Haase, an addition to the British fauna. It is necessary to obtain more material.

Ectoparasites.—Perhaps the most interesting piece of work attempted during the year lay in the commencement of a study of the Arthropod ectoparasites of the birds and mammals of the North of England, by Mr. Wm. Hall, of Fatfield, County Durham, and the writer. At the end of the year we had listed 4 ticks, including the recently described *Ixodes caledonicus*, Nuttall, from a starling; 28 different fleas, including *Trichopsylla dalei*, Rothsch., in numbers from house-martin's nests; *T. vagabundus*, Wagn., (*insularis*, Rothsch.), from cormorants; *Typhlopsylla dasycnemus*, Rothsch., *T. pentacanthus*, Rothsch., and *Ctenopsyllus spectabilis*, Rothsch., from small mammals; 5 Hippoboscid flies, including the light green *Oxypterum pallidum*, Leach, from the swift; 6 bloodsucking lice (*Anoplura*) from various mammals, and 84 or more bird-lice (*Mallophaga*). This latter material is forming the subject of a series of notes appearing in the *Journal of Economic Biology* and includes 30 or more species not, at that time, recorded as British. In connection with the study of bird-lice, I am of opinion that much remains to be done as regards those that affect the commoner birds; for instance, many of our most interesting discoveries were from birds such as the commoner gulls, cormorant, teal (an apparently new *Trinoton*), starling, blackbird, swift and chaffinch, and I attribute the reason for this to the fact that workers in the Mallophaga have secured their material chiefly from Zoological Gardens, ornithological friends and poulterers, and thus the ecto-parasites, of the rarer birds and game birds have become better known to us than those affecting the common birds.

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* *loc. cit.*, n.s., vol. iv., pp. 17-41, pl. i., and text figures, 1911.

† *Zool. Anzeiger*, vol. xxxviii., p. 445., 1911, and *Trans. Nat. Hist. Soc., Northumberland, Durham, and Newcastle*, n.s., 1912.

‡ *Zoologist*, July, 1912.

Protura.—In 1907 Prof. F. Silvestri* diagnosed an order of curious primitive creatures, apterous and without eyes or antennæ, the *Protura*, which stands alone in the Insect World. The Italian species have been beautifully monographed by Berlese†, who regards them as a new Order of Myriopods, the *Myrientomata.* I have had the pleasure of discovering species of the three diagnosed genera falling into the two families of the order, the *Acerentomidae* and *Eosentomidae*, and now that my time can be largely devoted to Zoology, I hope at no distant date to work out our British forms. The species are not really uncommon and are also widely distributed; I have found them in several localities from Dundee southwards.

Apterygota.—In 1910 I collected a good deal of new material in the order *Collembola* (Springtails), including numerous additions to our list, which I have not yet had the opportunity of bringing forward. In 1911 I scarcely did anything in this group with the exception, perhaps, of making other records of some of the species met with in 1910, such as the Neelids, *Megalothorax minimus*, Willem., and *Neelus murinus*, Folsom, the equally tiny *Micranurida pygmaea*, Axels., the curious *Tetracanthella shötti*, Wahl., *Tullbergia quadrispinus*, Börn., *T. krausbaueri*, Börn., *T. calipygos*, Börn. and others.

Thysanoptera.—I cannot conclude this brief review without a few words on my favourite insects, the thrips or *Thysanoptera*, although I was unable to do as much work in the group as in previous years. Two recently described species, *Amblythrips ericae*, Bagn., and *Bagnallia agnessae*, Bagn.,‡ were taken in new localities, including numerous examples of the previously unrecognised male of the latter; Mr. H. Wallace, F.E.S., discovered an interesting new species (*Physothrips latus*, Bagn.) at Whitfield, Northumberland, whilst Prof. Karny has shown that the large elm-leaf thrips taken by myself in the Derwent Valley and Teesdale differs from the type of *Liothrips hradacensis*, Uzel (in the Vienna Hofmuseum), to which I had referred the species; it must now be known as *Hoodia bagnalli*, Karny.§ At the Harbottle week-end meeting of the Northumberland and Durham Natural History Society, which I noted in this Journal, *Chirothrips hamatus*, Trybom (*dudae*, Uzel), *Frankliniella tenuicornis*, Uzel, *Bagnallia klapaleki*, Uzel, and *B. dilatata*, Uzel, were recorded as new to the British fauna. One of these, *C. hamatus*, was taken later at Matley Bog in the New Forest, where Mr. C. B. Williams and I had the pleasure of discovering *Cephalothrips monilicornis*, Reut., an insect I had anticipated would be found to occur in our country.

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* *Boll. Lab. Zool. Gen. e Ag. Portici*, Vol. I., [illegible] 96.

† *Redia*, vi., 1909.

‡ *Journal of Economic Biology*, Vol. VI., pp. 1-11., 1911.

Trans. Ent. Soc., 1912.

[*Reprinted from* 'The Zoologist' *for August, 1913.*]

p.292.

LITHOBIUS DUBOSCQUI, Brölemann, A CENTIPEDE NEW TO THE BRITISH FAUNA.

By Richard S. Bagnall, F.L.S., F.E.S.
(Hope Department of Zoology, University Museum, Oxford.)

On several occasions I have observed a small Lithobiid, which, when disturbed, instead of running swiftly to the edge of a stone and perhaps dropping like the common *L. crassipes*, immediately curls up and rolls off the surface of the stone that has just been raised on to the ground. The small number of antennal joints (up to twenty-eight) as compared with *L. microps* puzzled me, and I therefore submitted examples to Dr. Brölemann, of Pau, who replied that the species was referable to *Lithobius duboscqui*, Brölemann. I have compared my examples very carefully with Brölemann's description, a copy of which he kindly sent me, and they agree in every particular.

As examples of this species will almost certainly be found standing for *L. microps* in British collections, I give the following roughly translated extracts from the original description.

The rounded hind angles of *all* the dorsal scuta place it in the section *Archilithobius*.

Lithobius duboscqui, Bröl.

Brölemann. 'La Feuille des jeunes Naturalistes,' iii^{e} sér., xxvi., Nos. 318–319, 1896.

Body very convex, shining, somewhat parallel or more or less narrowed anteriorly, constricted behind the head and broadest about the eighth segment. Yellow, head reddish-brown and the legs light, especially the two posterior pairs, which are yellow-ochre or pale yellow. Length 5·5 to 7 mm., breadth 0·6 to 0·8 mm.

Cephalic plate subcordiform, the posterior angles rounded and the posterior border margined. Antennæ very short, composed of twenty-three to twenty-eight segments, broader than long, the last equal to about the length of the two preceding together. . . . Ocelli always three in number, disposed in a horizontal line, the posterior ocellus being the smallest and the following the largest. Coxæ of poison-claws longer than broad, with a very distinct median furrow; armed with 2 + 2 small but nevertheless well-formed and sharp teeth. All scuta margined laterally. . . .

The two last pairs of legs are short, very stout, and without furrows or apophyses in the male. Coxæ unarmed.

Armature of fourteenth pair $\frac{0.\ 0.\ 1.\ 0.\ 0}{0.\ 1.\ 2\text{–}1.\ 1\text{–}0.\ 0}$ claw double.

Armature of fifteenth pair $\frac{0.\ 0.\ 1.\ 0.\ 0}{0.\ 1.\ 1.\ 1.\ 0}$ claw double.

Coxal pores small, circular . . . disposition generally as follows:—1. 2. 2. 2 or 2. 2. 3. 2 (exceptionally 2. 3. 3. 3 in one, and in another 1. 2. 2/3. 2.).

External genital organs in the female armed with 2 + 2 very strong and long spines, especially the outer pair, which are sometimes a little curved outwardly. Claw (*unguis*) large, trilobed, with the two inner "teeth" much more developed than the third, which is frequently reduced to a pointed spine.

It is recorded by Brölemann from various parts of France.

I first collected specimens of this species from under stones lying on or slightly embedded in loose rich soil on the Durham banks of the Derwent near Blanchland, April, 1913, and in the same month discovered it in the neighbourhood of Oxford and Manchester.

Dr. Brölemann informs me (*in litt.* April 28th, 1913) that the species must now be known as *Monotarsobius duboscqui* (Bröl.).

[*Reprinted from* 'The Zoologist' *for March, 1914.*]

p. 102.

LITHOBIUS LAPIDICOLA, Meinert, A CENTIPEDE NEW TO THE BRITISH FAUNA.

By Richard S. Bagnall, F.L.S., F.E.S.

Whilst spending a short holiday in North Devon in August of last year (1913), I observed a smallish Lithobiid which occurred in the Ilfracombe district, amongst the larger pebbles and under stones at the foot of the cliffs at Hele Bay, the bathing cove, Ilfracombe, and at Lee Bay, where it was not only found on the shore but on the cliffs also. I could not identify it with any of our known British species and accordingly sent specimens to Dr. Brölemann, who with his customary kindness readily identified them as *Lithobius lapidicola*, Meinert, a South European species.

It comes in the group *Archilithobius*, and according to Latzel near to our species *calcaratus*, though Von Attems* places it in another subdivision, with *pelidnus*, *mutabilis*, &c.

L. lapidicola was described by Meinert in his 'Myriapoda Musæi Hauniensis,' ii., Lithobiini† in 1872, and a description will also be found in Latzel's 'Die Myriopoden der Oster.-Ungar. Monarchie.'‡

I regret that I have not yet found the opportunity of making a study of the species and therefore cannot, at present, offer any further remarks.

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* "Die Myriopoden Steiermarks," Sitz. k. Akad. Wiss. Wien Math.-Naturw. Classe, civ. 1895, pp. 117-238.

† Naturh. Tidskr., viii. 1872, p. 228.

‡ I. Die Chilopoden, 1880, p. 106.

[Reprinted from "The Scottish Naturalist," August 1913.]

THE SCOTTISH SYMPHYLA.

By RICHARD S. BAGNALL, F.L.S., F.E.S. (Hope Department of Zoology, University Museum, Oxford).

FOURTEEN species of Symphyla are now known as British, of which seven occur in Scotland; but as the Scottish records are merely the results of a few short collecting hours mainly in the Clyde and Forth areas, more species may be expected to occur. The forms that have not yet been recognised from north of the borders are *Scutigerella hanseni*, Bagn. (Co. Durham); *Scolopendrella notacantha*, Gervais (Cheshire); *S. isabellæ*, Grassi (Co. Durham); *S. dunelmensis*, Bagn. (Co. Durham); *S. jacksoni*, Bagn.

(Cheshire); *S. horrida*, Bagn. (Co. Durham); and *S. minutissima*, Bagn. (Durham and Yorkshire); whilst two European species, *Scutigerella nivea* (Scopoli) and *Scolopendrella microcolpa*, Muhr, have not as yet been met with in the British Isles. The *S. immaculata* recorded from the Forth area by Mr W. Evans[1] is perhaps a compound species, though all the *immaculata* recorded from Ireland are referable to that species alone. I have, unfortunately, not had the opportunity of examining Mr Evans' old collection.

In the following notes I have used the classification of Hansen; but in a paper I hope to publish shortly, I propose dividing the two groups *Scutigerella* and *Scolopendrella* into certain well-defined genera.

I am much indebted to my friend Mr Evans for the material he is now sending me from the Forth area, and shall always remember the pleasant hours I spent with him collecting these and other little-known creatures in a quarry at the foot of the Pentlands, and on Arthur Seat, Edinburgh, in October of last year (1912).

Scutigerella immaculata (Newp.).

One immature example from the Isle of May, 1910 (W. Evans); several, Rothesay, 1911 (R. S. B.); numerous specimens, Avonbridge, April, and one from Manuel, East Stirling, March 1912 (W. E.). In a quarry at the foot of the Pentlands, and on Arthur Seat, Edinburgh, Oct. 1912 (W. E. and R. S. B.); one, So. Queensferry, Oct. 1912 (R. S. B.). In a quarry, St Fort, near Dundee, Nov. 1912 (R. S. B.).

Scutigerella spinipes, Bagnall.

The first Scottish specimens were taken by Mr Evans at Avonbridge, Stirlingshire, 13th April 1912, and he has since sent me a specimen from the quarry at the foot of the Pentlands above referred to, Oct. 1912. It also occurs in Durham (Wear and Tees Valleys), Northumberland (Tyne Valley), and Cheshire.

Scutigerella biscutata, Bagnall.

This is apparently a less rare and more widely distributed species than *spinipes*.

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[1] *Proc. Roy. Phys. Soc.*, xvii., 109 (1907).

On the Clyde, near Bishopton, one example; in a quarry at St Fort, near Dundee, Nov. 1912, one example (R. S. B.). One immature specimen from Avonbridge, April 1912, and a few from the foot of the Pentlands, near Edinburgh, Oct. 1912 (W. E.). Occurs Northumberland (Cheviot and Tyne Valley), Durham (coast, Derwent, Wear and Tees Valleys), and Cheshire. Also in southern Germany (Verhoeff).

Scutigerella caldaria, Hansen.

In greenhouses. I have examined examples taken in the Botanic Gardens, Glasgow.

Scolopendrella subnuda, Hansen.

One example from under a stone, near Brodick, on the Isle of Arran, 1911, and another from So. Queensferry, Oct. 1912 (R. S. B.). Several from the Isle of May, Nov. 1912 (W. E.). In Oct. 1912, Mr Evans and I met with this small form in fair numbers in the now almost historic quarry at the foot of the Pentlands, and on Arthur Seat, near Edinburgh. It is very widely distributed in England.

Scolopendrella vulgaris, Hansen.

A single example taken from under a stone, on the Clyde, near Bishopton; several from a field near Rothesay, in Bute; one from the head of Loch Lomond, near Ardlui; one from St Fort, near Dundee, and one from Colinton, near Edinburgh, Oct. 1912 (R. S. B.). One example, Isle of May, Nov. 1912 (W. E.). In fair numbers from the quarry at the foot of the Pentlands, and on Arthur Seat, near Edinburgh, Oct. 1912 (W. E. and R. S. B.). Apparently widely distributed.

Scolopendrella delicatula, Bagnall.

A single example from the banks of Loch Lomond, near Ardlui, Spring 1912 (R. S. B.). Whilst collecting with me in the quarry at the foot of the Pentlands, near Edinburgh, Mr Evans took a pair of this rare form, and there are a few (mostly young) in the collection we made together on Arthur Seat, Edinburgh, Oct. 1912. It is a distinctly rare species, but evidently rather widely distributed, being also known from Northumberland (Cheviot and Tynedale), Durham (coast, Derwent, and Wear Valleys), Yorkshire (coast), and Cheshire.

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Vale of Derwent Naturalists' Field Club, Trans. pp. 94-158, n.s. I, pt. 2, 1913, (publ. 1914).

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48 3 ---The WOODLICE (Terrestrial Isopoda) of Northumberland and Durham. R. S. Bagnall, pp. 94-115 [1-22].

49 4.---The MYRIAPODS of the Derwent Valley R. S. Bagnall, pp 116-128 [23-35].

50 5.---Preliminary List of SPIDERS, HARVESTMEN & PSEUDO-SCORPIONS found in the Derwent Valley. R. S. Bagnall and W. L. Turner, pp. 129-151 [36-58].

51 6.---ORIBATIDAE (Beetle-mites), of the County of Durham, with special reference to the Derwent Valley. Rev. J. E Hull, M.A., pp 152-158 [59-65].

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p.p. 94 to 158.

ZOOLOGY.

p.94.

3.—THE WOODLICE (Terrestrial Isopoda) OF NORTHUMBERLAND AND DURHAM, WITH KEYS TO THE GENERA AND SPECIES. (Text Figures 1-14).

BY RICHARD S. BAGNALL, F.L.S., F.E.S.,
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(Hope Dept. of Zoology, University Museum, Oxford),
V.P. and Sectional President for Arthropoda, etc.

Woodlice, or *Terrestrial Isopod Crustacea*, are to be found almost everywhere. They are continually met with (and ignored) by naturalists searching for other more favoured creatures, and it is only within the last few years that more general interest has been shown in their study.

Comparatively recently, but prior to 1906, a few papers were published by a small band of workers, principally the Rev. Canon A. M. Norman, F.R.S., Prof. G. S. Brady, F.R.S., Dr. R. F. Scharff, and the Rev. T. R. R. Stebbing, F.R.S.

In that year (1906) Messrs. Webb and Sillem's " British Woodlice " appeared, in which all the species—twenty-five —then known, were figured; and being issued at a price within the means of everyone, the publication served its purpose by marking a distinct impetus in the study.

At the same time it must be realised that the possession of this work, together with Prof. G. O. Sars' splendid descriptions and figures of so many of our British Woodlice in his " Crustacea of Norway," vol. ii., is not now sufficient for the study of our species.

Very probably one or other of our present workers will sooner or later produce a more detailed Monograph of the British species, which, though naturally appealing to a more restricted circle, will enable workers to readily identify their captures, and perhaps deal with allied Continental forms. In the meantime I have attempted in this list of the Northumberland and Durham species to partly fill a want by drawing up tables of families, genera and species, as simply as possible, without sacrificing accuracy, and including, in many instances, a multiplicity of characters, so that each important feature may be separately checked.

The keys to the species are confined to the *Trichoniscidæ* and *Armadillidiidæ*. We have not made such strides in the *Oniscidæ*, and all our British species of *Porcellio*, the only genus containing several, are very closely described and figured by Sars.

As some recent workers appear to be unaware of many of the notes and papers published since 1906 I have appended a bibliography.

Many Woodlice have been regarded as introduced forms, being recorded entirely, or almost entirely from greenhouses and old gardens, where the uniform moisture and rich soil is especially suitable, notably *Trichoniscus roseus*, *T. pygmaeus*, *Trichoniscoides albidus*, *Haplophthalmus danicus*, *H. mengii*, *Metoponorthus pruinosus* and *Cylisticus convexus*. I am able to say, conclusively I think, that all these species are truly endemic, a statement that is strongly borne out by the records hereafter. In this, I think, lies the chief value of the list and the main excuse for its compilation.

Most of the species have been already recorded in Norman and Brady's Crustacea of Northumberland and Durham (1909), in which my notes and records of local Woodlice to that date were recorded.

The letters N1., N2. or/and D. after each name signifies the vice-county North Northumberland (Cheviot), South Northumberland, or/and Durham respectively.

KEY TO THE FAMILIES.

1.—Outer and inner rami of uropods similar in shape (see figs. 1-3) 2

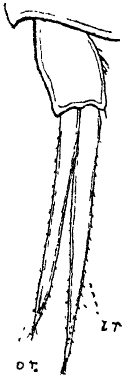
Outer ramus of uropods broader than the inner ramus (see figs. 6 and 14).. 3

2.—Size usually larger. Head without lateral plates. Flagellum of antenna multiarticulate, with 10 or more distinctly defined joints. Uropods entirely exposed (figs. 1-2). External sexual appendages of male double... LIGIIDÆ (see p. 4)

Size smaller, more elongated. Head with small lateral plates. Flagellum of antenna with fewer than 10 joints (which are notso distinctly defined (figs. 7 and 8). Uropods not entirely exposed (figs. 3). External sexual appendages of male simple .... TRICHONISCIDÆ (see p. 4)

3.—Body oval, usually flat, with lateral plates more or less expanded. Uropods long and protruding (fig. 6) ONISCIDÆ (see p. 11)

Body strongly convex, contractile into a ball. Uropods short, not extending beyond the limits of the last segment (figs. 12 and 14) .... ARMADILLIDIIDÆ (see p. 16)



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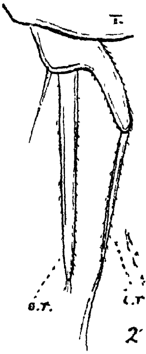

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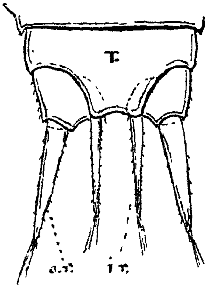

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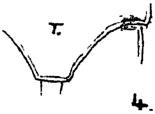

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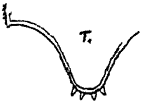

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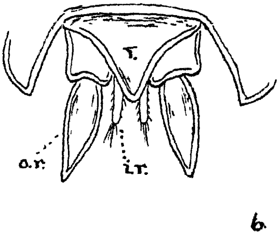

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FIGS. 1 and 2.—Left Uropods of (1) *Ligia oceanica* (*L*) and (2) *Ligidum hypnorum* (Cuv.)

FIG. 3.—*Trichoniscus pusillus* Br., end of abdomen, showing Telson and Uropods (rami similar in shape).

FIGS. 3 to 5.—Telson of (3) *T. pusillus* (apex emarginate), (4) *T. pygmæus* (apex truncate), and (5) *T. stebbingi* (apex rounded).

FIG. 6.—*Porcellio dilatatus* Br., end of abdomen, showing Telson and Uropods (rami dissimilar in shape).

T.=Telson. *o.r.* and *i.r.*=outer and inner rami.

FAMILY **LIGIIDÆ.**

1.—Size large (20 to 30 mm.) metasome broad. Uropods elongated, basal part not produced inside, rami subequal (fig. 1) (Habitat littoral) .... Genus LIGIA, Fabricius

2.—Size small (about 9 mm.), metasome small and abruptly contracted. Uropods with basal part produced at the end inside to a conical process carrying the inner ramus. Outer ramus generally larger than the inner (fig. 2). (Habitat, wet moss) Genus LIGIDIUM, Brandt

Genus LIGIA, Fabr.

Ligia oceanica, L. N1., N2., D.

We know only one British species, found commonly on our coasts from Berwick to the mouth of the Tees. It is our largest Woodlouse.

Genus LIGIDIUM, Brandt.

[*Ligidium hypnorum* (Cuvier).

The only British representative of the genus. It has been found in Surrey, Essex and Warwickshire, and as it occurs not uncommonly in Sweden and Denmark we might reasonably expect to find it in the North of England.

FAMILY **TRICHONISCIDÆ.**

1.—Abdomen broad; dorsal face sculptured with more or less distinct longitudinal rib-like or tuberculate ridges. Side plates of body lamellarly expanded, not contiguous. Head with frons triangularly produced; eyes simple. Genus HAPLOPHTHALMUS, Schöbl

Abdomen narrow; dorsal face smooth or irregularly tuberculate. Side plates not lamellarly expanded, contiguous. Head with frons rounded; eyes absent, simple, or each consisting of three visual elements 2

2.—Eyes each composed of three visual elements, rarely simple. Left mandible with 2, right with only 1 penicil behind the cutting part .... Genus TRICHONISCUS, Brandt

Eyes absent or simple. Left mandible with 3, right with 2 penicils behind the cutting part.
Genus TRICHONISCOIDES, G. O. Sars

Genus TRICHONISCUS, Brandt.

1.—Apex of telson truncate or slightly emarginate (see figs. 3 and 4). Species truly indigenous.. 2

Apex of telson more or less arcuate or rounded and furnished with 3 or 4 short broad spines (see fig. 5). Our species found in hothouses... 6

2.—Body broad, dorsal face but slightly convex, rather coarsely tuberculate. Eyes simple. Colour white to a clear minium-rose..T. ROSEUS (Koch)

Body oblong-ovate, dorsal face more convex, smooth or minutely tuberculate. Eyes composed of 3 visual elements 3

3.—Dorsal face smooth, shining, apex of telson slightly emarginate (see fig. 3) Length about 4 mm................................ 4

Dorsal face practically smooth, more or less minutely tuberculate. Apex of telson truncate (see fig. 4). Length 2 mm. and 8 mm. 5

4.—Peduncle of antennæ spinose, flagellum composed of 4 joints (see fig. 7) Colour dark reddish brown marbled with white
T. PUSILLUS, Brandt

And colour a beautiful violet..................VAR. VIOLACEUS, Schöbl

Peduncle not spined, flagellum composed of 5-7 joints (fig. 8). Otherwise as in *pusillus*...T. INTERMEDIUS, Bagn. (prov.)

5.—Size larger, (8 mm.) and more ovate. More finely tuberculate. Peduncle of antennæ without spines, flagellum composed of 5-7 joints. Colour claret-brown marbled with lighter patches
T. VIVIDUS (Koch)*

Size smaller (2 mm.) and more linear; less finely tuberculate. Peduncle of antennae spinose, flagellum 3-jointed. Colour whitish, with a few light reddish pigmentary ramifications.
T. PYGMÆUS, G. O. Sars

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* Pack-Beresford and Foster tabulate this species as having simple eyes like *roseus*. I have not studied it.

6.—Eyes composed of 3 visual elements; form oblong-ovate. Colour darker. Length about 3.5 mm. 7

Eyes composed of 3 visual elements or simple; form linear. Colour white. Length less than or about 3.0 mm........... 8

7.—Dorsal surface tuberculate. Flagellum of antenna 4-7 jointed. Last pair of legs with the last joint in both sexes densely ciliated on the outside. Telson with apex broadly and evenly rounded (see fig. 5)..................T. STEBBINGI, Patience

Dorsal surface spinulose. Flagellum of antenna 3-jointed. Last pair of legs in both sexes with the last joint armed with 3 or 4 short but fairly prominent spines. Telson obtusely rounded ....T. SPINOSUS, Patience

8.—Eyes simple. Body 3.5 times as long as broad. Side plates of mesosome not toothed .... T. LINEARIS, Patience*

Eyes composed of 3 visual segments. Body nearly 5-0 times as long as broad. Side plates each armed with 5 stout downwardly curved teeth .... TRICHONISCUS sp., Bagnall†

Trichoniscus roseus. Koch. N1., N2., D.

This beautiful Woodlouse is nearly always regarded as a garden or greenhouse species, being common in old gardens and greenhouses throughout the country. In the following records, however, I am able to give habitats which go to show that we can claim *T. roseus* as a truly endemic species. The white variety is not uncommon.

NORTHUMBERLAND.—In hothouses and gardens, Newcastle-upon-Tyne and Alnwick. In numbers amongst shale on wet clayey sea banks at Seaton Sluice and near the Abbey, Tynemouth, Autumn, 1911. On sea banks, Whitley Bay, March, 1914.

DURHAM.—In gardens at Winlaton, Gibside, Penshaw and Sunderland. In numbers under stones lying on a clayey soil on the banks of a burn running into the Wear near Fatfield (W. Hall and R.S.B.), and with *Cylisticus* under stones on the river banks near Washington.

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* Described from specimens taken by the writer in Kew Gardens.

† From a hothouse in the Glasnevin Botanic Gardens.

Trichoniscus pusillus (Brandt). N1., N2., D.

I have found this common species, which occurs chiefly in damp situations amongst dead leaves, moss, etc., wherever I have collected, though it is always rare on our moorlands.

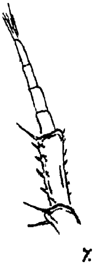
T. pusillus var. *violaceus*, Schöbl. N1., N2., D.

See Bagnall in Norman & Brady.

A beautiful form which I am confident is referable to the *Trichoniscus violaceus*, Schöbl, described from waterfalls in Bohemia. It was first met with (and recognised) by Mr. Gill and myself in the moss of a waterfall and among refuse at the foot, over which water continually drops, at Gibside.

NORTHUMBERLAND.—In damp situation by side of the stream which runs into Seaton Sluice (A. M. Norman). On the sea banks by trickling water at Seaton Sluice and Tynemouth. Near Wooler, May, 1913 (H. S. Wallace and R.S.B.). Gosforth Lake (H. S. Wallace).

DURHAM.—Gibside, in moss of waterfalls (E. L. Gill and R.S.B.). Under stones on the sea banks, Fulwell and Ryhope (G. S. Brady); at Ryhope, Blackhall Rocks, and Hart. In well at Winlaton and from under stones in a small stream at Scaur banks, Winlaton Mill. On the banks of the Derwent at the Ladies' Steps near Swalwell (H. S. Wallace and R.S.B.), and on the banks of a stream running into the Wear near Fatfield (W. Hall). In a dene near Fence Houses.



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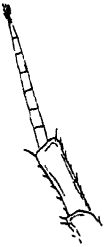

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FIG. 7.—*Trichoniscus pusillus* Brandt.
FIG. 8.—*Trichoniscus intermedius* (prov.) Bagn. Last joint of peduncle and the flagellum of antenna.

Trichoniscus intermedius (prov.), Bagnall. N2.

See Bagnall in Norman & Brady.

Telson and general appearance as in the ubiquitous *T. pusillus* except the antennæ which are like those in *T.*

vividus (Koch) ; the flagellum 5-7 jointed, and the peduncle very smooth, without the spines which characterize the peduncle of *T. pusillus* (see figs. 7 and 8). I have not yet seen further examples of this form.

NORTHUMBERLAND.—Two examples taken amongst herbage, Butcher Hill Farm, near Matfen, September, 1906.

Trichoniscus pygmæus (G. O. Sars). N1., N2., D.

This is another truly endemic species and one which is probably widely distributed throughout the British Isles. It was first discovered in this country, almost simultaneously, by Mr. Patience and myself in the summer of 1906, in the Clyde area and North of England respectively.

NORTHUMBERLAND.—In gardens and cool conservatories, Newcastle, Wylam-on-Tyne, Matfen, Alnwick and Blanchland. Sea banks at Hartley and Tynemouth. By the roadside near Etal Village and at Skirlnaked near Wooler, May, 1913. Bywell (H. S. Wallace).

DURHAM.—Gardens at Winlaton, Gibside, Fellside, Ravensworth, Penshaw, South Hylton, Sunderland and St. John's Chapel. In quarries by the banks of rivers or streams and in woods and fields Gibside, Winlaton, Swalwell (on moss), Hylton, Penshaw, Lambton, Leamside, Barnard Castle, Piercebridge and Eggleston-in-Teesdale. On the railway banks near Bradbury.

Trichoniscus stebbingi (Patience). N1., N2 , D.

In hothouses, at roots of potted plants.

NORTHUMBERLAND.—Wylam, August, 1907 ; Alnwick, September, 1907 ; Newcastle, 1907 ; and in numbers at the roots of orchids, February, 1913.

DURHAM.—Winlaton Mill, 1909.

Genus TRICHONISCOIDES, G. O. Sars.

1.—Form slightly more ovate ; colour of body usually dull reddish-brown or claret, with underside noticably whitish. Flagellum of antennæ composed of 3 joints .... T. ALBIDUS, B.L.

2.—Form more linear ; colour golden yellow. Flagellum of antennæ composed of four joints.............. T. SARSI, Patience*

* Very striking and important differences in the structure of the 1st and 2nd pairs of pleopoda and the 7th peræopod in the male are fully tabulated and figured in Patience's valuable paper on these two species.

Trichoniscoides albidus (Budde-Lund). N.D.

Another truly endemic form, sometimes found in numbers on the clayey sea-cliffs or on our river banks.

Mr. Patience has shown that the *T. albidus* of G. O. Sars is a different species, and names it *T. sarsi*. I recently (1912) found *T. sarsi* (Patience) on the sea-banks near Whitby, Yorks, and it may be expected to occur in our Counties. It was previously only known from the neighbourhood of Christiania, Norway.

I have only seen one white example of *T. albidus.*

NORTHUMBERLAND.—A few examples with *T. roseus* and *T. pygmæus* in a cool conservatory at Alnwick, September, 1907. On sea banks, Whitley Bay, March, 1914.

DURHAM.—Carley Hill Quarry near Sunderland, 1904 (G. S. Brady). In a garden, Winlaton, 1907. On the sea banks between Sunderland and Hartlepool (Ryhope, Blackhall Rocks and Hart), sometimes in fair numbers, usually found under quite small stones embedded in the rich clayey soil where moist. In numbers on the banks of the Wear between Sunderland and Lambton ; at Hylton, Coxgreen, Penshaw, and Lambton ; on the Derwent near the Ladies' Steps, Swalwell (soil sandy) May, 1913, and one specimen on the banks of a stream at Bradbury near Durham.

Genus TRICHORINA (B.-L.)

Trichorina tomentosa (B.L.) N2., D.

On December 2nd, 1907, Mr. Donisthorpe and I found several specimens of a small white Woodlouse in propagating houses, Kew, which were chiefly, though not entirely found in the neighbourhood of an introduced West Indian ant, *Wasmannia auropunctata*, (Roger). I later found examples in other greenhouses and Mr. Patience took it in the Glasgow Botanic Gardens. We decided that it was referable to *Bathytropa thermophila* (Dollfus), but as his figures were not good I merely recorded it as *Bathytropa* sp. (1909-3). More recently it has been taken by Mr. Foster and others in Belfast Botanic Gardens and brough forward by Mr. Foster [1911-2] as this species. His specimens were identified by Prof. Budde-Lund as *Trichorina* (*Alloniscus*) *tomentosa*

(B.-L.) a Venezeulan species, of which Dollfus' name *Bathytropa thermophila* is a synonym.

NORTHUMBERLAND.—Several in a propagating house in Leazes Park, Newcastle-on-Tyne, 1910.

DURHAM.—One example from a hothouse at Winlaton Mill, 1911.

Genus HAPLOPHTHALMUS, Schobl.

1.—Size usually smaller (♀ 3 mm.). Mesosome with very distinctly sculptured ribs; abdomen with a pair of prominences, one on each side of mid-line of the 3rd segment. (Antennulæ with 4 sensory filaments) .... H. MENGII, Zaddach

2.—Size usually larger (♀ 4 mm.) Mesosome with tubercles arrangedin longitudinal rows; abdomen without prominences on 3rd segments. (Antennulæ with 6 sensory filaments.) .... H. DANICUS, Budde-Lund

Haplophthalmus mengii (Zaddach). N1., N2., D.

Though generally regarded as a rare species I have met with this sluggish Woodlouse in many widely separated localities, chiefly in the open country, from Dundee in the north to Oxford in the south. The following data leaves no doubt as to the species being endemic. Only three localities are given in Webb and Sillem's "British Woodlice."

NORTHUMBERLAND.—In gardens and cool greenhouses, at Newcastle (October, 1906 onwards). A few examples at Skirlnaked and Whitsunbank Hill near Wooler, May, 1912 and May, 1913. Ninebanks near Whitfield, February, 1913 (J. E. Hull).

DURHAM.—Fulwell Quarry near Sunderland (G. S. Brady). Under stones in gardens at Winlaton, Fellside, Penshaw, Gibside, Hylton, Sunderland and Hart. In quarries, Penshaw and Hylton. On the sea banks at Ryhope and Hart frequent; also near Greatham Salt Marshes (April, 1910, and twice in 1913). Derwent banks at Winlaton Mill and near Swalwell. Wear banks (sometimes very plentiful) at Cox Green, Fatfield, Lambton, Leamside, and Durham, and in a dene near Fencehouses. Plentiful on the Durham banks of the Tees near Piercebridge and Barnard Castle, and in the neighbourhood of Bradbury.

Haplophthalmus danicus (Budde-Lund). N2., D.

Although mostly recorded from gardens there is no doubt that this, too, is an endemic species, though I have not met with it so often as *H. mengii.* I have recently taken specimens in the open country near Oxford.

NORTHUMBERLAND.—A mature male and young in garden Wylam-on-Tyne, August, and in numbers in gardens and cool greenhouses Leazes Park, Newcastle, August, 1907.

DURHAM.—Humbledon Hill near Sunderland (G. S. Brady). Several examples with *Trichoniscoides albidus* on the Wear banks near Penshaw (soil somewhat sandy), Autumn, 1911.

FAMILY **ONISCIDÆ.**

1.—Eyes absent. Flagellum composed of a single broad joint. Myrmecophilous.................................. Genus PLATYARTHRUS

Eyes compound. Flagellum composed of 2 or 3 joints 2

2.—Flagellum 3 jointed 3

Flagellum 2-jointed 4

3.—Abdomen broad. Head with side lobes............Genus ONISCUS

Abdomen narrow. Head without side lobes ......Genus PHILOSCIA

4.—Body strongly convex, able to roll up into a ball (as in *Armadillidium* but with uropods protruding).........Genus CYLISTICUS

Body more or less depressed, unable to roll up into a ball... 5

5.—Abdomen broad. Head with frontal lobe projecting. Genus PORCELLIO

Abdomen narrow. Lobes of head scarcely developed. Genus METOPONORTHUS

Platyarthrus hoffmannseggii (Brandt). D.

An interesting little inhabitant of ants' nests, which is very rare in Scotland and also rare in the North of England.

DURHAM.—Carley Hill Quarry near Sunderland (G. S. Brady). Two examples with *Myrmica rubra* at Chopwell, 1906, and several with the same ant at Greatham, near Hartlepool, June, 1908.

Oniscus asellus, L. N1., N2., D.

Common everywhere.

Philoscia muscorum (Scopoli). N1., N2., D.

Generally common under stones in hedgerows, and amongst dry grass, vegetable matter. I have taken it throughout the area. All our northern examples are darker than specimens from the South of England. I know three well-marked and striking colour varieties which I think might be designated as follows :—

P. muscorum var. *obscura* nov. N1., N2., D.

Robust, very dark and almost unicolorous. Not uncommon under stones in gardens and on cultivated land; found throughout Northumberland and Durham.

P. muscorum var. *flava* nov. D.

Also robust. Bright yellow, markings dark. In damp moss of waterfalls, two examples from Gibside, Co. Durham, and one from Saltburn, Yorkshire. A less robust, light lemon-yellow variety occurs in the South.

[*P. muscorum* var. *rosea* nov.

Moderately robust. Of a beautiful minium or deep rose-pink colour, even more strikingly coloured than *Trichoniscus roseus*.

South of England.—I have seen examples from Lundy Island and the Isle of Wight (H. St. G. K., Donisthorpe), and Sidmouth, South Devon (A. Randell Jackson). Mr. Cummings records it from Lundy Island and North Devon.

Philoscia patiencei, Bagnall. D.

Undoubtedly introduced with plants. Described from numerous specimens taken by the author in a propagating house, Kew Gardens, and since recorded by Dr. A. Randell Jackson from Chester. It is a small species which when alive bears a very strong resemblance to the common *Trichoniscus pusillus*, both in its general appearance and movements.

Durham.—Immature examples taken in garden at Winlaton October, 1906, and February, 1907.

Porcellio scaber (Latreille). N1., N2., D.

Common everywhere and more plentiful than the ubiquitous *Oniscus asellus*. The following extract is taken from the "Crustacea of Northumberland and Durham." "Including varieties *marmorata* and *marginata* of Brandt and Ratzeburg, the latter variety very rare. Also a large form, bright red in colour, which might be called var. *rufa*. A single specimen Winlaton, and three examples sent to me by Mr. Donisthorpe, taken in the nest of the red ant *Formica sanguinea*. A small variety is found in colonies in the busiest parts of the nests of the wood ant *Formica rufa* at Corbridge-on-Tyne; it is much smaller than the type, the dorsal surface not so scabrous, cephalic lobe less pointed, and distal joint of the flagellum longer in relation to basal joint; but as the sexual characters, etc., on dissection, entirely agree with *P. scaber*, it would be better to regard it as a form of that species, most likely produced after several generations with the ants; it might bear the distinguishing name var. *Darwiniana*. On two occasions I have found colonies almost identical with the last living under stones in rock-pools of salt water and entirely submerged; and when disturbed they merely ran along the bed of the pool to seek shelter under another stone or piece of weed. (Bagnall)."

The following are the localities for the varieties indicated above:—

P. scaber var. *marmorata* (Br. and Ratz.) N1., N2., D.

Not uncommon with the type.

P. scaber var. *marginata* (Br. and Ratz.) N1., N2., D.

Rarer, but has occurred in the three vice-counties.

P. scaber var. *rufa* (Bagnall), in Norman and Brady [1909], var. *rufescens* (Collinge) [1913], D.

One specimen in a field near Winlaton.

P. scaber var. *darwiniana* (Bagnall), in Norman and Brady [1909]. N2., D.

Common in the nests of the wood ant *Formica rufa* at Corbridge and Stocksfield-on-Tyne, and in Chopwell Woods.

Porcellio pictus (Brandt and Ratzeburg). N1., N2., D.

A pretty species, readily distinguished in the field by its black head.

NORTHUMBERLAND.—Several in rubbish heap behind Hancock Museum, Newcastle, August, 1907. Common on an old wall by road side, Corbridge-on-Tyne, and a few in the neighbourhood of Wooler, May, 1912 and May 1913. Crawling on an old wall, Shildon, near Blanchland, March, 1913.

DURHAM.—In gardens and cellars, Winlaton, 1906 onwards. Common under stones and under bark of logs laid for firewood, Egglestone-in-Teesdale, April, 1907. In the neighbourhood of Barlow and Winlaton, and in Gibside. Several in an old starling's nest, Penshaw, July, 1911.

Porcellio dilatatus (Brandt). N1., N2., D.

In old gardens and cool greenhouses, usually in numbers.

NORTHUMBERLAND.—Newcastle, August, 1907 onwards; Alnwick, September, 1907.

DURHAM.—Winlaton, May, 1907, in very large numbers; Sunderland Hylton, Lambton, Ravensworth (June, 1907), etc.

Porcellio rathkei (Brandt). N1., N2., D.

A distinctly rare species, but apparently wide spread in England. Not yet recorded from Scotland.

NORTHUMBERLAND.—Stocksfield (G. S. Brady), two examples from near Alwinton, June, 1911, and a young specimen from Ninebanks sent me by the Rev. J. E. Hull, February, 1913.

DURHAM.—Humbledon Hill, near Sunderland, and near Winlaton Mill (G. S. Brady). One example from a meadow near Rowlands Gill, May, 1907.

Porcellio lævis (Latreille). N2.

This is a distinct but rare species of which I am only able to bring forward one local record. Not yet recorded from Scotland.

NORTHUMBERLAND.—One adult and three young in heap of garden refuse, etc., behind the Hancock Museum, Newcastle-on-Tyne, January,. 1907.

Genus NAGARUS (B.-L.)

Nagurus cristatus (B.-L.) N2.

Introduced with plants. Two other allied species *Angara lenta* (B.-L.) a Mediterranean species, and *Angara nana* (B.-L.) known from Madagascar, have been recorded from British greenhouse.

NORTHUMBERLAND.—One example in one of Mr. Cookson's greenhouses, August 28th, 1907. Identified by the late Dr. Budde-Lund.

Metoponorthus pruinosus (Brandt). N1., N2., D.

A beautiful creature, but the pruinose bloom is lost at once when it is put into spirit. It is often common in greenhouses with *Porcellio dilatatus*, but is by no means so common in the open country.

NORTHUMBERLAND.—Greenhouses and gardens: Wylam-on-Tyne, August, 1906, Newcastle, swarming with *P. scaber* in garden rubbish, October, 1906, and Alnwick, common, September, 1907. Open country: a few examples in neighbourhood of Wooler, May, 1912, and at Etal Village, near Wooler (H. S. Wallace and R.S.B.), May, 1913.

DURHAM.—Garden, Burnmoor Rectory (Canon A. M. Norman, F.R.S.) One specimen in a quarry near Winlaton, April, 1906, where it also occurs in a cellar and swarming in greenhouses, June, 1907; in numbers under stones on road side from Greatham station to Saltmarsh, June, 1906 and March, 1913; Axwell Park in the open, September, 1906. Gibside Woods and Lambton in the open country, and in hothouses, Sunderland.

Two other species of this genus are known, *M. cingendus* (Kinahan) from Ireland and South Devon, and *M. melanurus* (B.-L.) a littoral species recently recorded by Dr. Scharff [1910] from Ireland.

Cylisticus convexus (De Geer). N1., N2., D.

Though not common, this Woodlouse, which like the true pill-woodlice *Armadillidium*, is able to roll up into a ball, is evidently widely distributed. I first found it locally at Whitley Bay in June, 1907, and have since observed it in several localities.

NORTHUMBERLAND.—Whitley Bay, one example, June 2nd, 1907; Alnwick, common in conservatory, ix. 1907; Wooler, May, 1912 and again in 1913. Hexham (H. S. Wallace) June, 1913.

DURHAM.—Occasionally in a manure heap in Axwell Park from November, 1908 onwards; in garden at Winlaton, in cool conservatory at Hylton, near Sunderland, and in some numbers with *Trichoniscus roseus* under stones on the banks of the river near Washington. In a field near Fatfield.

FAMILY **ARMADILLIDIIDÆ.**

1.—Eyes compound. First body segment with the posterior angle of lateral plate simple, not nicked or divided (see figs. 10 and 11). Uropods extending to apex of telson at most.
Genus ARMADILLIDIUM, Brandt

2.—Eyes simple. First body segment with the posterior angle of lateral plate divided behind (see fig. 9). Uropods extending slightly behind apex of telson though not beyond the epimeral plates of penultimate abdominal segment.
Genus ELUMA, Budde-Lund

Genus ARMADILLIDIUM, Brandt.

1.—Colour white, sometimes shaded with grey; dorsal surface closely granular and sparsely set with minute hairs. Outer ramus armed with a distinct tooth at the outer apical corner. Distal joint of the flagellum 3 times as long as the basal. Length 6.0 mm. .... A. ALBUM, Dollfus

Colour more or less dark, with lighter variegations. Surface smooth and shining. Outer ramus without tooth. Length 5mm. or 12 to 17 mm.. 2

2.—Size smaller (5 mm.) Side plates of first body segment abruptly truncated at posterior angle (see fig. 11). Distal joint of flagellum 3 times as long as the basal. Colour brown with yellow and lighter markings.
A. PULCHELLUM, Zencker

Size larger (up to 17 mm.). Side plates of first body segment with the posterior angles more or less acute (see fig. 10). Joints of flagellum practically subequal. Ground colour usually lighter or darker grey, marked with yellowish and lighter markings 3

3.—Antennæ shorter* (about 0.25 the length of the body) with the distal joint of flagellum slightly shorter than the basal. Telson much shorter than broad ; uropods with the outer ramus much shorter than the basal part and broader than long. Length 12 to 15 mm. ....A. VULGARE, Lat.

Antennæ longer (about 0.35 to 0.4 the length of the body) with the joints of flagellum practically subequal. Telson longer than broad (see fig. 14) ; uropods with the outer ramus at least as long as broad and longer than the basal part. Body finely and closely punctured, and on sides, at least, more or less distinctly tuberculate 4

4.—Size smaller (15 mm.) more convex. Tubercles less distinct. Head with narrow, strongly projecting frontal lobe. Telson much longer than wide, tapering with sides incurved and apex obtusely rounded ; uropods with outer ramus much longer than basal part and much longer than broad (see fig. 14) .... A. NASATUM, Budde-Lund

Size larger (17 mm.), broad and less convex. Tubercles more distinct. Head with broad and short frontal lobe. Telson slightly longer than wide ; sides scarcely incurved and apex truncate ; uropods with the outer ramus only slightly longer than the basal part and as long as broad (as in fig. 12).
A. DEPRESSUM, Brandt

NOTE.—Two other European species may reasonably be expected to occur in Great Britain ; they are :—

Armadillidium opacum (Koch). Like *A. vulgare* but only 9 mm in length ; light grey in colour, irregularly marked with darker patches. Telson very broad and bluntly rounded apically, and the distal joint of flagellum nearly twice as long as the basal.

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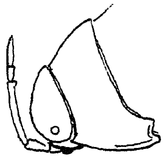
*Figure in Webb & Sillem's "British Woodlice," is, in this respect, misleading.

**Armadillidium pictum* (Brandt). Size 8 mm. Most like *A. pulchellum* in colour and markings, but with hind angles of side plates of first body segment acute. Differs from *vulgare, opacum* and *pulchellum* in the shape of its telson which is triangular in form and as fong as broad (fig. 13).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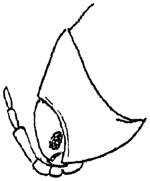
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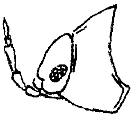
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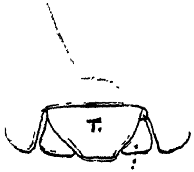

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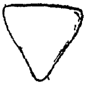
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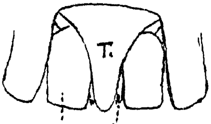

14.

FIGS. 9, 10 and 11.—Head and first thoracic plate (viewed laterally) of (9) *Eluma purpurascens* B.-L. (single eye, nicked hind angle); (10) *Armadillidium vulgare* (Latr.) (pointed hind angle); and *A. pulchellum* Zencker (truncate hind angle).

FIGS. 12 and 14.—End of abdomen, showing Telson and outer rami of Uropods of *Aramadillidium pulchellum* (Zenk.) and *A. nasatum* B.-L. respectively.

FIG. 13.—Telson of *A. pictum* Brandt.

Armadillidium vulgare (Latreille). N1., N2., D.

Though moderately common and widely spread I have never known this species to occur in any numbers in the Northumberland and Durham area.

NORTHUMBERLAND.—Coast; Tyne and North Tyne, Alnwick, Wooler, Blanchland and Slaley, etc.

DURHAM.—Winlaton, Gibside, Chopwell, Edmundbyers, Hylton, Penshaw, Lambton, Weardale, Roker, Ryhope, Blackhall Rocks, Hart, and Greatham. Teesdale.

*Mr. Standen has recorded this species from Westmorland—see "Lancashire Naturalist," July, 1913.

Armadillidium pulchellum (Brandt). N1., N2., D.

This small species is generally found in dry situations, and often in the proximity of ants. Our first local specimens were taken by Prof. G. S. Brady, F.R.S.

NORTHUMBERLAND.—Near Stocksfield, Devil's Water, 1906 (G. S. Brady). In colonies of the black ant (*Formica fusca*) at Hedley, near Stocksfield, and in a wood near Ebchester, October 5th, 1907, several examples. Under stones by a road side near Alwinton, June, 1911, rare. The Rev. J. E. Hull has recently sent me examples taken on the Fell near Ninebanks at about 1,500 feet, February, 1913, and the following month I found it at Shildon, near Blanchland.

DURHAM.—A few adult and numerous young specimens occurred regularly under a small stone lying on the slopes of a path side near Winlaton, from August, 1906, until the following Spring. Gibside, April, 1913.

Armadillidium nasatum (Budde-Lund). N1., N2., D.

In Ireland, Scotland, and the greater part of England this species more or less commonly in hothouses and conservatories, but in the South of England it is also to be found in the open country living under natural conditions. *A. nasatum* is recorded from France, Spain, and Italy, and I have taken hothouse examples in Norway, Denmark and Belgium.

NORTHUMBERLAND.—Wylam, Alnwick and Newcastle-upon-Tyne.
DURHAM.—Sunderland, Penshaw, Hylton and Winlaton.

Genus ELUMA (Budde-Lund).

[*Eluma purpurascens* (B.-L.)

This species was only recently recorded from the British Isles from the neighbourhood of Dublin, where it was met with in numbers by Mr. D. R. Pack-Berefsord and the writer.

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* Although read in June of 1906 this paper was not issued until March, 1908.

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4.—THE MYRIAPODS OF THE DERWENT VALLEY.

By RICHARD S. BAGNALL, F.L.S., F.E.S

The creatures included in the group familiarised to naturalists under the name of "Myriapoda," fall into four Orders of which two—the Chilopoda or Centipedes and Diplopoda or Millipedes are well-known to most of us. The inter-relationship of these four Orders, however, is not so close as might be supposed from the fact that they are thus grouped together; in fact the Chilopods and Diplopods are really widely separated in the modern classification of the Arthropods, and we still retain the term "Myriapoda," not because there is any real justification for doing so, but more as a matter of convenience.

I have recently collected and studied these creatures and hope shortly to publish an account of the Northumberland and Durham species. The following records are of those species that have occurred within the confines of our little valley, no less than fifty-five forms in all. These creatures have been curiously neglected by British naturalists, and will well repay the attention of anyone who wishes to carry out original work.

Order CHILOPODA.

This order contains the common centipede and its allies (easily recognised by their short bodies which carry fifteen pairs of legs), and the very long, slender, many-legged Geophilids so often seen curled up under stones, bark, etc. Three Lithobiids are additions to the British fauna, *L. duboscqui*, Brölemann; *L. piceus*, subspecies *britannicus*, Bagn. (which Mons. Brölemann says may be referable to a new species, but on account of the difficulty of the group to which it belongs, he suggests that it should be regarded as a new variety or subspecies of *piceus*), and *L. nigrifrons*, Latz. & Haase.

FAMILY **LITHOBIIDÆ.**

Genus LITHOBIUS (Leach).

L. crassipes (L. Koch).

Common and widely distributed.

L. microps (Mein.)

A Winlaton example is almost certainly referable to the true *microps*, possessing, as it does, 32 antennal joints, the maximum number in the following species being 28. I have not had the opportunity of studying this specimen since M. Brölemann has pointed out to me that the specimens with fewer antennal joints are his *L. duboscqui*.

L. duboscqui (Brölemann).

A few examples from the Durham side of the Derwent, near Blanchland, March, 1913. Not previously recorded as British.

L. calcaratus (C. Koch).

Rare. I have an example (♀) from Gibside taken in 1906.

L. forficatus (L.)

This is the common large centipede, and is to be found throughout the area, not only near habitations, but in fields and woods, and on the moors.

L. piceus subspecies *britannicus* (Bagn.) nov.

I first discovered this fairly large and distinct form (recognised on the field by its bright yellow tibiæ) on the Blanchland Moors in March of this year (1913), and a fortnight later took further examples on Buckshott Moor near Hunstanworth (Co. Durham), and on Cowbyers Fell, Blanchland Moor (Northumberland). Dr. Brölemann, to whom I submitted specimens considers it advisable to describe it as a form of *piceus* (a species not yet recorded as British) though it may ultimately prove to be a new species

L. variegatus (Leach).

Not uncommon in wooded districts, Axwell, Winlaton Mill, Swalwell, Gibside, Lintz Green, Chopwell, Ebchester, Buckshott Moor at over 1200 feet, and Shildon Burn, near Blanchland. A fine species which is apparently confined to the British Islands.

L. nigrifrons (Latz. and Haase).

Two mutilated specimens found in a field between Hollinside and Gibside in 1906, are apparently referable to this species. As this is the only British record I hope to secure further specimens.

L. glabratus (C. Koch) (*melanops,* Newp.)

Very frequently found, especially under bark of old, rotting fir stumps; Blanchland, Buckshott Moor, near Hunstanworth, Ebchester, Chopwell, Gibside, Winlaton and Brockwell.

Genus HENICOPS (Newp.)

H. fulvicornis (Mein.)

One ♀ Buckshott Moor near Hunstanworth, March 29th, 1913, at about 1,400 feet above sea level.

FAMILY **SCOLOPENDRIDÆ.**

Genus CRYPTOPS (Leach).

C. hortensis (Leach).

Usually found in greenhouses. I have taken examples at Newcastle and Winlaton.

FAMILY **GEOPHILIDÆ.**

Genus GEOPHILUS (Leach).

G. longicornis (Leach)=*flavus* (De G.)

Common and widely distributed.

G. proximus (C. Koch).

Common, though not so frequent as *longicornis*.

G. carpophagus (Leach).

A common species on moors and in uncultivated places, and also on the sea-shore. On the moors between Shotley Bridge and Hunstanworth and on Blanchland Common.

G. truncorum (Bergs. & Mein.)

A small species usually found under stones and bark of stumps in woods; Brockwell, Winlaton, Axwell, Swalwell, Winlaton Mill, Gibside, Chopwell, Ebchester, Hunstanworth and Blanchland.

Genus SCOLIOPLANES (Bergs. et Meinert)

S. crassipes (C. Koch).

Gibside, 2 ♂'s and 5 ♀'s, May, 1911. This is the only record for the counties of Northumberland and Durham.

Another species, *S. maritimus*, is very frequent on the sea-shore, though local, whilst a third species, *acuminatus*, has occurred at Blackhall Rocks.

Genus SCHENDYLA (Bergs. et Meinert).

S. nemorensis (C. Koch).

A small and somewhat rare species met with very infrequently under stones in woods, Gibside and Winlaton.

Genus STIGMATOGASTER (Latzel).

S. subterraneus (Leach).

This, the largest of our local "wire" centipedes, is probably often turned up when digging in gardens, though I can only give one Derwent Valley record, namely a few examples from a Winlaton garden, 1906. I have also met with it in Newcastle.

Genus MECISTOCEPHALUS (Newp.)

M. carniolensis (C.K.)

I once took several examples of this Geophilid in hothouses, Leazes Park, Newcastle. Mr. Evans records it from Edinburgh hothouses.

ORDER SYMPHYLA.

White centipede-like creatures with 12 (in some cases 11) pairs of legs, ranging from 1½ to about 8 millemetres in length, and usually found under stones more or less deeply embedded in earth.

I have recently made a somewhat special study of the Order, and the classification here adopted is that forming the subject of a paper I recently submitted to the Linnean Society.*

FAMILY **SCOLOPENDRELLIDÆ.**

SUB-FAMILY SCUTIGERELLINÆ Bagnall.

Genus SCUTIGERELLA Ryder.

S. immaculata (Newp.)

Our largest and perhaps most widely distributed species of the family. Local but not uncommon; Axwell Park and Gibside, Edmundbyers and Shildon Burn, near Blanchland. Until recently *S. immaculata* was the only recognised species of Symphyla in the British Isles.

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* Journ. Linn. Soc., Zool., xxxii., pp. 159–199, October, 1913.

S. spinipes Bagnall.

Described from Teesdale and taken as near our borders as Stocksfield-on-Tyne, this species will almost certainly be met with in the Derwent Valley.

S. biscutata Bagnall.

Described from the Wear Valley and since recorded from many localities in the North of England and Scotland.

I have local specimens from Gibside Woods taken in the spring of 1912.

Genus NEOSCUTIGERELLA Bagnall.

N. hansenı (Bagnall).

Described from an adult example taken with *S immaculata* in a quarry, Axwell Park.

Genus HANSENIELLA Bagnall.

H. caldaria (Hansen).

A hothouse species taken at Ravensworth and Newcastle.

SUB-FAMILY SCOLOPENDRELLINÆ Bagnall.

Genus SCOLOPENDRELLOPSIS Bagnall.

S. subnuda (Hansen).

A minute form which is not uncommon in some localities and widely distributed in England. Winlaton Mill and Gibside.

Another European species, *S. microcolpa* (Muhr) will probably yet be met with in the British Isles, whilst *Scolopendrella notacantha* (Gervais) recorded from Cheshire, will probably occur locally.

Genus SYMPHYLELLA Silvestri (Bagnall).

S. dunelmensis (Bagnall).

A rather large form which occurs in numbers in Gibside but has not yet been found anywhere else. Two allied species, *S. isabellae* (Grassi) and *S. jacksoni* (Bagnall) have been taken at Penshaw and Chester respectively, whilst another species, *S. horrida* (Bagnall) has been described from Hart.

S. vulgaris (Hansen).

I find this species to be the most common of the group, and it has occurred in the Derwent Valley at Gibside, Fellside, Winlaton, Winlaton Mill, Axwell Park, and Hunstanworth, near Blanchland.

S. delicatula (Bagnall).

A rare but widely distributed species, small and very slender, and originally described from Wear Valley specimens. Local examples are from Fellside and Newcastle, and Axwell Park. The specimen from the last named locality was taken by my friend Mr. H. S. Wallace. Another and very minute species. *S. minutissima* (Bagnall) has been taken in Teesdale and Yorkshire.

ORDER PAUROPODA.

The minute and curious animals composing this Order have been studied by few naturalists, and there is ample scope for valuable original work in this field. Most of the species are less than one millemetre in length, and are in reality, not uncommon, especially in rich soils, and amongst frass under bark of deciduous trees lying in damp situations.

I have taken seven species (in other words all the British species as yet known) in the Wear Valley, which is especially rich in "earth dwelling" Arthropods on account, I think, of its proximity to the limestone formation.

FAMILY **PAUROPODIDÆ.**

Genus STYLOPAUROPUS Cook.

S. pedunculatus (Lubbock).

Winlaton Mill, one example. Also known from the Wear Valley.

Genus PAUROPUS Lubbock.

P. huxleyi Lubbock.

The first specimen of *huxleyi* I ever saw was taken under the bark of a tree stump on the Scaur banks, Winlaton Mill, whilst more recently (December, 1911) I have taken several examples under similar conditions in Gibside.

Genus ALLOPAUROPUS Silvestri.

A. vulgaris (Hansen).

The first recorded British examples of this small species, which is rarer with us than *gracilis*, were taken near Mitford, Northumberland. It occurs sparingly at Gibside, Winlaton, Winlaton Mill, Blaydon and Newcastle-upon-Tyne

A. gracilis (Hansen).

One of our commonest and most widely distributed British species, often occurring in large numbers amongst the damp frass found unner the bark of rotten oak logs. Very common in Gibside, where I took the first British specimens on October 4th, 1907, and common in other parts of the Valley.

ORDER DIPLOPODA.

Members of this Order compose the millipedes proper, of which our species fall into three more or less natural groups, which we may roughly call the "Pill-millipedes" (*Glomeridæ*), the "Square-backed millipedes" (*Polydes-* (*æ*, *Brachychæteumidæ*, and *Chordeumidæ*) and the *mid*

"Cylindrical millipedes" (*Julidæ* and *Protoiulidæ*) some of which are commonly called "false wire-worms." The Pill-millipedes curiously resemble the Pill-Woodlice (*Armadillidium*). Amongst the square-backed forms I have been particularly fortunate in discovering several noteworthy additions to the British fauna:—*Brachychæteuma bagnalli,* described by Verhoeff as the type of a new genus and family, from a Gibside specimen; the small *Titanosoma jurassicum,* Verh.; *Polydesmus coriaceus,* Porat (from near Darlington), *Microchordeuma,* sp., and *Craspedosoma simile,* Verh. In the *Protoiulidæ Isobates varicornis,* C.K. (Gibside) and *Napoiulus* sp. (Fencehouses) were first recorded as British from Durham captures.

Genus **GLOMERIDÆ.**

Genus GLOMERIS Latr.

G. marginata (Villiers).

This, the common pill-millipede, is not uncommon and is to be found throughout the area.

G. marginata var. *perplexa.*

A small, prettily marked and very distinct form is referred to the var. *perplexa* by Prof. Verhoeff, whilst another authority refers it to a distinct species. I have taken it occasionally in woods at Gibside and Winlaton as well as in Teesdale and in the Clyde area of Scotland, and my specimens are as yet the only known British examples.

FAMILY **POLYDESMIDÆ.**

Genus POLYDESMUS Latr.

P. complanatus (L.)

A large, square-backed millipede and the commonest of the family.

P. denticulatus (C. Koch).

Rare. A few Gibside examples are the only local ones I have seen. I have taken a third species, *P. coriaceus* (Porat), from a mole's nest, Bradbury, near Darlington.

Genus ORTHOMORPHA.

O. gracilis (C.L.K.)

A common hothouse species, Newcastle, Ravensworth, and Winlaton Mill.

Genus BRACHYDESMUS Heller.

B. superus Latzel.

Not uncommon, Axwell, Winlaton Mill, Gibside, Chopwell, Shotley Bridge, Edmundbyers, Hunstanworth and in the neighbourhood of Blanchland. It occurs in a variety of habitats and often occurs in numbers in the wet bottoms of old haystacks.

Genus TITANOSOMA Verhoeff.

T. jurassicum Verhoeff.

Females only. In numbers from gardens, I [illegible], and Gibside, and one example from the Gibside v This species was only described by Verhoeff in 1910 fro single example (♀) taken on the Danube, and very sho afterwards I found it in large numbers in a very restric area in a Wear Valley dene. It is one of our smallest Dipl pods and is apparently widely distributed. I have seen "wild" examples from Scotland, and three Durham localities and garden specimens from Northumberland, Durham, Cheshire and Oxfordshire.

FAMILY **BRACHYCHÆTEUMIDÆ** Verhoeff.

Genus BRACHYCHÆTEUMA Verhoeff.

B. bagnalli Verhoeff.

One ♂, Gibside Woods. A fair-sized species, which (being blind) may have its proper home deep down in the earth. The single example, fortunately a male, was not only the type of a new genus and species, but also of a new family.

FAMILY **CHORDEUMIDÆ.**

Genus *Microchordeuma* Verhoeff.

Microchordeuma sp., (*silvestre* K.)

One ♀, Gibside.

Genus POLYMICRODON Verhoeff.

P. latzeli (Verhoeff).

This species is not uncommon but local in the North of England, and much commoner than the following species. Axwell, Winlaton, Gibside, Friarside, etc.

Genus ATRACTOSOMA Fanz.

A. polydesmoides (Leach).

I have only seen a few local examples of the species I regard as *A. polydesmoides*. I think that most of the specimens of *A. polydesmoides* recorded by British writers will be found to be referable to *P. latzeli*. There are distinctly two species, of which this is much the rarer one, and I hope to have the opinion of Prof. Verhoeff (who has written at some length in a recent paper on my *P. latzeli* material) on this matter before I publish my account of the Northumberland and Durham Myriapods.

Genus CRASPEDOSOMA (Leach).

C. rawlinsi (Leach).

Two specimens found under a stone, half submerged, in Snipe's Dene, Gibside, 1907, are apparently referable to *C. rawlinsi*.

C. simile (Verhoeff).

Added to the British list on several examples found under the loose bark of a fallen tree lying in a damp situation. Gibside, 1912, together with the subspecies *rhenanum.*

C. simile rhenanum (Verhoeff).

Found with the typical form.

Family **JULIDÆ.**

Genus Julus (s.l.) Brandt.

J. ligulifer (Latz.-Verh.)

Gibside, ♂ and ♀, rare.

J. sabulosus (L.)

I have occasionally seen this large species, easily recognised by the pair of ferrugineus dorsal stripes, in woods at Winlaton Mill and Gibside.

J. albipes (C.L.K.)=*niger* Leach.

Another large millipede. Common and widely distributed.

J. punctatus (Leach)=*silvarum* Mein.

Very common, especially under bark and in rotten logs. It also occurs in numbers in the walls of the wood-ant's nests at Chopwell and Ebchester.

J. luscus Meinert.

Gibside, both sexes. A rare species of which this is my only record for the counties of Northumberland and Durham.

J. fallax Meinert.

Gibside, females only. Not common.

FAMILY **PROTOIULIDÆ.**

Genus BLANIULUS Gervais.

B. pulchellus (C. L. Koch)=*venustus* (Mein.)

Gibside, 1 ♂ and 1 ♀, August, 1911 ; 2 ♀'s, June, 1912. A rare British species.

Genus AMSTEINIA (Verhoeff).

A. fuscus (Amstein).

Females only ; common under bark of trees, especially conifers. Blanchland, Ebchester, Friarside, Gibside, Winlaton, etc.

Genus ISOBATES (Menge).

I. varicornis (C. Koch).

7 ♀'s and young found under the bark of a fallen fir tree in Gibside, May, 1911, are the first British specimens recorded. It is not uncommon in Gibside, and has since occurred in other parts of England.

Genus TRICHOBLANIULUS Verhoeff.

T. guttulatus (Bosc.)

Common and widely distributed ; both sexes. This species is often to be found in large numbers in gardens where they do much damage to young and tender plants.

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5.—PRELIMINARY LIST OF SPIDERS, HARVESTMEN AND PSEUDO-SCORPIONS FOUND IN THE DERWENT VALLEY.

BY RICHARD S. BAGNALL, F.L.S. AND W. LEONARD TURNER.

In the winter of 1905-1906, when Dr. Randell Jackson was on the point of publishing his account of "The Spiders of Tynedale," one of us (R.S.B.) though primarily engaged in other subjects, was tempted to collect spiders in the precincts of the Derwent Valley. This collecting was carried on intermittently until 1909, but almost entirely during the winter months, and the spiders so captured were very kindly identified by Dr. Randell Jackson. As some were not without interest Dr. Jackson has published notes of the more notable captures which will be found by reference to his numerous papers on British Spiders.

One of the most interesting captures was that of *Diplocephalus protuberans* (Camb.) taken in December, 1906 an addition to the British fauna, whilst several others such as *Cnephalocotes interjectus, Ballus depressus, Dictyna variabilis, Hilaira frigida, Eugnatha striata*, and the pseudo-scorpions *Chthonius rayi* and *Chthonius tetrachelatus* were additions to the Northumberland and Durham lists.

Since then this work has been taken up by the junior author, who has already increased the list and hopes to collect in the Valley more widely and systematically so that ultimately we may have more accurate knowledge of its spider fauna. In this work he has the great assistance of the Rev. J. E. Hull's expert aid and advice. It has been felt however, that a preliminary list of captures would be both desirable and useful.

During the compilation of this list we worked together in the early spring of this year in the higher reaches of the Valley—on one occasion joined by our friend Mr. H. S. Wallace, F.E.S., and thus were able to confirm most of Dr. Randell Jackson's Blanchland records and make several interesting additions to our list such as *Lycosa nigriceps, Panamomops bicuspis, Coryphaeus simplex, Leptyphantes obscurus, Linyphia pusilla* and *Tetragnatha extensa,* whilst Mr. Wallace and the senior author found *Porrhomma egeria* and undoubted examples of the newly described *Porrhomma pallidum* (Jackson) in the lower parts of the Valley during the same period.

Altogether we are now able to record 208 spiders, 12 harvestmen and 3 pseudo-scorpions.

Our warmest thanks are due to Dr. A. Randell Jackson and the Rev. J. E. Hull for their whole-hearted assistance in examining our captures.

ORDER I.—ARANEÆ (SPIDERS.)

FAMILY DYSDERIDÆ.

HARPACTES HOMBERGII (*Scop.*).

Gibside (R.S.B.).

SEGESTRIA SENOCULATA (*L.*).

Winlaton Mill, Gibside, Swalwell, and near Blanchland (R.S.B. & W.L.T.).

FAMILY OONOPIDÆ.

OONOPS PULCHER (*Templ.*).

Blanchland, 1 ♂, April, 1906; Winlaton, both sexes, March, 1906; Axwell Park, in haystack refuse, March, 1913 (R.S.B.).

FAMILY DRASSIDÆ.

PROSTHESIMA LATREILLII (*Sim.*).

Occasionally under stones on Blanchland Common (A.R.J.).

DRASSODES CUPREUS (*Bl.*)

Winlaton, 1 ♀, March, 1906 (R.S.B.); Blanchland Common, 1 juv., March, 1913 (R.S.B. & W.L.T.)

DRASSODES TROGLODYTES (*Koch.*)

Spen Banks, Winlaton Mill and Blanchland Common, in June, 1907, and July, 1909. Numerous (R.S.B. & W.L.T.)

GNAPHOSA ANGLICA (*Camb.*)

Blanchland Common, under stones and turves, in May, June and July (A.R.J.); females only on Cowbyers' Fell and Blanchland Common (Northd.) on March 30th, 1913 (R.S.B. & W.L.T.)

CLUBIONA RECLUSA (*Camb.*)

In numbers, Winlaton and Blanchland (R.S.B. & W.L T.)

CLUBIONA GRISEA (*Koch.*)

Spen Banks, females only, June, 1907 (R.S.B.)

CLUBIONA LUTESCENS (*Westr.*)

Blanchland, September, 1909, common with *reclusa* (W.L.T.); Lady's Steps, Swalwell, under loose bark, March, 1913 (R.S.B.)

CLUBIONA BREVIPES (*Bl.*)

Gibside (R.S.B.)

CLUBIONA COMTA (*C. L.K.*)

Common throughout area.

CLUBIONA DIVERSA (*C.L.K.*)

Hunstanworth, April, 1906, 1 ♀ (R.S.B.)

CHIRACANTHIUM CARNIFEX (*Fabr.*)

Taken in Derwent Valley, but note of locality mislaid (R.S.B.)

CHIRACANTHIUM LAPIDICOLENS (*Sim.*)

Single adult female, under stone, Blanchland Common, in June (A.R.J.); adult female, May, 1909, Axwell Park (W.L.T.)

ANYPHOENA ACCENTUATA (*Walck.*)

Gibside, ♀ and young, December, 1905 (R.S.B.)

AGROECA BRUNNEA (*Bl.*)

Neighbourhood of Winlaton (R.S.B.)

AGROECA PROXIMA (*Camb.*)

Winlaton, February, 1906, 1 ♀ (R.S.B.)

ZORA SPINIMANA (*Sund.*)

Gibside, at roots of heath (R.S.B.)

MICARIA PULICARIA (*Sund.*)

Above Hunstanworth, 1 ♂, April 15th, 1906 (R.S.B.)

FAMILY THOMISIDÆ.

XYSTICUS CRISTATUS (*Clk.*)

Common, especially in haystack refuse.

XYSTICUS SABULOSUS (*Hahn.*)

An immature ♀, Blanchland Common, June (A.R.J.)

OXYPTILA TRUX (*Bl.*)

Gibside (R.S.B.)

OXYPTILA PRATICOLA (*Koch.*)

Winlaton, 1 ♂ (R.S.B.)

PHILODROMUS AUREOLUS (*Clk.*)

Common throughout area, especially on gorze

PHILODROMUS CAESPITICOLIS (*Walck.*)

Chopwell Woods (R.S.B.)

FAMILY ATTIDÆ.

EPIBLEMUM SCENICUM (*Clk.*)
Gibside, Winlaton and Blaydon (R.S.B.)

EPIBLEMUM CINGULATUM (*Panz.*)
1 ♀ in Derwent Valley, locality not known (R.S.B.)

BALLUS DEPRESSUS (*Walck.*)
West Woods, Gibside, 1 ♀. This capture was made with two others equally unexpected and remarkable, namely *Dictyna variabilis* and *Eugnatha striata*, all three new to the fauna of the North of England (R.S.B.)

NEON RETICULATUS (*Bl.*)
Gibside and Axwell Park Wall (R.S.B.)

EUOPHRYS ERRATICUS (*Walck.*)
Winlaton (R.S.B.)

HASARIUS ADANSONII (*Sav.*)
In hothouses at Winlaton Mill and Ravensworth (R.S.B.)

FAMILY AGELENIDÆ.

CRYPHÆCA SILVICOLA (*C.L.K.*)
Common throughout area.

CŒLOTES ATROPOS (*Walck.*)
Common throughout area.

ARGYRONETA AQUATICA (*Latr.*)
Gibside, Lily Pond. Mr. Herd records the Water Spider from the Lily Pond, and many years ago I brought up what I presume to be this spider whilst dragging the pond for water beetles (R.S.B.)

TEGENARIA DERHAMII (*Scop.*)
Common in houses, Winlaton, Swalwell, Gibside, and Blanchland.

TEGENARIA ATRICA (*C.L.K.*)

A Winlaton example is in Newcastle Museum; Axwell Park greenhouses, 2 immatures, December, 1910 (W.L.T.)

CICURINA CINEREA (*Panz.*)

Winlaton ♀s, January and February, 1906 (R S.B.)

TEXTRIX DENTICULATA (*Oliv.*)

Axwell Park Wall (R.S B.)

FAMILY HAHNIIDÆ.

ANTISTEA ELEGANS (*Bl.*)

Dead rushes, Lockhaugh and Spen Banks (R.S.B.)

HAHNIA MONTANA (*Bl.*)

Females only, Winlaton, December, 1905, and Gibside in June, 1906, and April, 1913 (R.S.B.)

FAMILY LYCOSIDÆ.

PIRATA PIRATICUS (*Clk.*)

This and the following species occur in marshy places. Winlaton, March, 1907, and Spen Banks in June, 1906 (R.S.B.)

PIRATA HYGROPHILUS (*Thor.*)

Swampy wood near Winlaton (R.S.B.)

TROCHOSA RURICOLA (*De Geer*).

Winlaton, Winlaton Mill and Spen Banks (R.S.B. & W.L.T.)

TROCHOSA TERRICOLA (*Thor.*)

Winlaton Mill and Spen Banks, females only (R.S.B.)

TROCHOSA PICTA (*Hahn.*)

Sandy places on Blanchland Common (A.R.J.); Spen Banks and Winlaton Mill (R.S.B.)

TROCHOSA CINEREA (*Fabr.*)
Blanchland, (Northd.) among shingle, September, 1910, 1 ♂ (W.L.T.)

TARENTULA PULVERULENTA (*Clk.*)
Shotley Bridge, common (W.L.T.)

TARENTULA ANDRENIVORA (*Walck.*)
Common throughout area.

LYCOSA AMENTATA (*Clk.*)
Also common.

LYCOSA AGRICOLA (*Thor.*)
On shingle bed near river, Winlaton Mill (R.S.B.); and Blanchland (Northd.) shingle, September, 1910 (W.L.T.)

LYCOSA PULLATA (*Clerck*).
Numerous.

LYCOSA LUGUBRIS (*Walck*).
Gibside (R.S.B.)

LYCOSA PALUSTRIS (*Linn.*)
Winlaton (R.S.B.)

LYCOSA HERBIGRADA (*Bl.*)
Several females in June, Blanchland Common (A.R.J.

LYCOSA NIGRICEPS (*Thor.*)
One example, Roughside, March 16th, 1913 (R.S.B. W.L.T.)

FAMILY DICTYNIDÆ.

DICTYNA VARIABILIS (*C. L. K.*)
Gibside, both sexes, spring, 1909. An unexpected addition to our north country fauna. Previously regarded as a purely southern form (R.S.B.)

DICTYNA UNCINATA (*Westr.*)
Female specimen from Derwent Valley (R.S.B.)

DICTYNA ARUNDINACEA (*Linn.*)

Blanchland (Northd.), September, 1910, numerous (W.L.T.), juveniles in numbers on gorse at Shildon Burn, near Blanchland, March, 1913 (R.S.B. & W.L.T.)

AMAUROBIUS FENESTRALIS (*Strœm*).

Common throughout area.

AMAUROBIUS SIMILIS (*Bl.*)

Winlaton, Axwell and Gibside in cellars and outbuildings, June, 1906 (R.S.B.); 1 ♀ in haystack refuse, The Snods, near Shotley Bridge, and 1 ♀ in an outbuilding at Blanchland, March, 28th 1913 (R.S.B. & W.L.T.)

AMAUROBIUS FEROX (*Walck.*)

Winlaton, apparently rare (R.S.B.)

FAMILY MIMETIDÆ.

ERO FURCATA (*Vill.*)

Winlaton and Gibside, occasionally (R.S.B.)

FAMILY THERIDIIDAE.

THERIDION TEPIDARIORUM (*C.L.K.*)

Immatures from Axwell greenhouses, December, 1910 (W.L.T.), in a greenhouse near Winlaton (R.S.B.)

THERIDION LINEATUM (*Bl.*)

Common.

THERIDION DENTICULATUM (*Walck.*)

Immature males, Lockhaugh, April, 1906 (R.S.B.)

THERIDION VARIANS (*Hahn.*).

Abundant.

THERIDION SISYPHIUM (*Clerck*).

Common throughout area.

THERIDION PALLENS (*Bl.*)
Gibside and Winlaton (R.S.B.)

STEATODA BIPUNCTATA (*Linn.*)
In a cellar, Winlaton (R.S.B.); Winlaton Mill, August, 1911 (W.L.T.)

ROBERTUS LIVIDUS (*Bl.*)
Females only, Gibside, Winlaton and Blanchland, and both sexes, Axwell, March, 1913 (R.S.B.); Shotley Bridge, April, 1911, ♀ (W.L.T.); Cowbyer Fell, Blanchland Common (Northd.) and Buckshott Moor at 1,400 feet, March 30th, 1913, both sexes (R.S.B. & W.L.T.)

ROBERTUS ARUNDINETI (*Camb.*)
Females with their egg sacs, in July, on Blanchland Common (A.R.J.)

ENOPLOGNATHA THORACICA (*Hahn.*);
Taken locally (R.S.B.)

PHOLCOMMA GIBBUM (*Westr.*)
Axwell Park, March, 1906, 1 ♂; Gibside, ♀'s (R.S.B.); Hunstanworth, in haystack refuse, 1 ♂; and by beating conifers, 1 ♀ in March, 1913 (R.S.B. & W.L.T.)

ONESINDA MINUTISSIMA (*Camb.*)
Winlaton, May, 1907 (R.S.B.)

FAMILY ARGIOPIDÆ.

SUB-FAMILY I., LINYPHIINÆ.

CERATINELLA BREVIS (*Wid.*)
Both sexes, Winlaton, February and near Blanchland in April, 1906 (R.S.B.); 1 ♀, Durham banks of the Derwent near Blanchland, March, 1913 (R.S.B. & W.L.T.)

CERATINELLA BREVIPES (*Westr.*)
Both sexes, Chopwell, May, 1907. (R.S.B.)

LOPHOCARENUM MENGII (*Sim.*)

One of our rarer spiders, 1 ♀ in April, 1906, Blanchland (R.S.B.)

CNEPHALOCOTES INTERJECTUS (*Cb.*)

One ♂ taken in Gibside, March, 1907; apparently very rare in the north (R.S.B.)

CNEPHALOCOTES OBSCURUS (*Bl.*)

Winlaton in February, 1906, (R.S.B.); By beating gorse 1 ♂ Shildon Burn, near Blanchland (Northd.) and 1 ♂ in haystack refuse at Snods near Shotley Bridge, March, 1913 (R.S.B. & W.L.T.)

TISO VAGANS (*Bl.*)

Occasionally Winlaton, Axwell and Gibside (R.S.B.)

ERIGONELLA HIEMALIS (*Bl.*)

Winlaton, ♂, February, 1906 (R.S.B.)

CALEDONIA ALIENA (*Kulcz.*) Sub-species EVANSII (*Camb.*)

Blanchland Common (Northd.) among short heather (A.R.J.); on the moors Blanchland Common (Northd) and Buckshott Fell, ♀'s only, March, 1913 (R.S.B. & W.L.T.)

SAVIGNIA FRONTATA (*Bl.*)

Common throughout area.

DIPLOCEPHALUS CRISTATUS (*Bl.*)

Common.

DIPLOCEPHALUS PERMIXTUS (*Camb.*)

April 15th, 1906, 1 ♂ near Blanchland (R.S.B.)

DIPLOCEPHALUS LATIFRONS (*Camb.*)

Females from Spen Banks, January, and Blanchland in April, 1906; Gibside, 1 ♂, April, and Axwell, ♂, March, 1913 (R.S.B.); 1 ♂ from Durham side of Derwent near Blanchland, March, 1913 (R.S.B. & W.L.T.)

DIPLOCEPHALUS FUSCIPES (*Bl.*)

Apparently common.

DIPLOCEPHALUS PICINUS (*Bl.*)

Females, Winlaton and Gibside, March and April and Winlaton Mill, 1 ♂, June, 1906; and Winlaton Mill, August, 1911 (R.S.B. & W.L.T.)

DIPLOCEPHALUS BECKII (*Camb.*)

Axwell Park, July, 1910, under loose bark of old tree. Rare in the valley (W.L.T.)

DIPLOCEPHALUS PROTUBERANS (*Camb.*)

Gibside, December, 1906, 1 ♂ taken amongst waterfall moss in Snipes dene. Then new to the British fauna but has recently been recorded from Yorkshire. Previously known from France and Bavaria (R.S.B.)

TROXOCHRUS SCABRICULUS (*Westr.*)

On shingle bed near river at Winlaton Mill (R.S.B.)

TROXOCHRUS PRÆCOX (*Camb.*)

Under stones on Blanchland Common (A.R.J.); Chopwell, ♂, May, 1907 (R.S.B.)

TROXOCHRUS SUBITANEUS (*Camb.*)

In very dry haystack refuse on the moors at Hunstanworth, ♂, April 15th, 1906, and in Axwell Park, March, 1913 (R.S.B.)

TROXOCHRUS EXILIS (*Bl.*)—*Tapinocyba pallens* (Camb.)

Winlaton, Winlaton Mill, Spen Banks, Gibside, Ebchester and around Blanchland chiefly in pine-needle refuse (R.S.B.)

LOPHOMMA PUNCTATUM (*Bl.*)

January, 1907, at Lockhaugh (R.S.B.)

LOPHOMMA HERBIGRADUM (*Bl.*)

Winlaton, December, 1906, Gibside and Axwell, females only (R.S.B.); in loose moss in a wood near Hunstanworth, March, 1913, 1 ♀ (R.S.B. & W.L.T.); both sexes in Gibside, April, 1913 (R.S.B.)

DICYMBIUM NIGRUM (*Bl.*)

Common.

DICYMBIUM TIBIALE (*Bl.*)
Also common.

POCADICNEMIS PUMILA (*Bl.*)
Occasionally (R.S.B.); in grass Axwell Park, June, 1910 (W.L.T.)

PEPONOCRANIUM LUDICRUM (*Camb.*)
Gibside, January, 1906; Winlaton, ♂, in May, 1907 (R.S.B.)

METOPOBACTRUS PROMINULUS (*Camb.*)
Rare. An immature specimen, presumably female, at Winlaton in March, 1906 (R.S.B.)

MINYRIOLUS PUSILLUS (*Wid.*)
Both sexes in moss, Barlow, Gibside, and Blanchland (R.S.B.)

PANAMOMOPS BICUSPIS (*Camb.*)
Haystack refuse, 1 ♂, Hunstanworth, in March, 1913 (R.S.B. & W.L.T.)

ENTELECARA ERYTHROPUS (*Westr.*)
Winlaton and Gibside, April, 1906; common on shrubs, etc. (R.S.B.)

THYREOSTHENIUS BIOVATUS (*Camb.*)
In nests of the wood ant (*Formica rufa*), Chopwell and near Ebchester (R.S.B. & W.L.T.). I have taken an adult ♂ and young ♀ from herbage in low-lying flats at Lockhaugh, at least two miles away from the nearest nests of *F. rufa*. Bold records the wood ant from Gibside (opposite Lockhaugh) but I have never seen it there (R.S.B.)

EVANSIA MERENS (*Camb.*)
With *Formica fusca* Winlaton, January, 1906 (R.S.B.)

WIDERIA ANTICA (*Wid.*)
Females from near Winlaton, February and April, 1906; Axwell Park, March, 1913 (R.S.B.); Winlaton Mill, ♀, August, 1911 (W.L.T.)

WIDERIA CUCULLATA (*C.L.K.*)

In woods near Winlaton and Barlow amongst fallen pine needles, ♀, Hunstanworth, April, and ♂, Chopwell, May, 1907 (R.S.B.); amongst loose moss and herbage on the Durham banks of Derwent, near Blanchland, March 16th, 1913 (R.S.B. & W.L.T.)

PROSOPOTHECA MONOCEROS (*Wid.*)

Blanchland (Northd.) both sexes in moss, October (A.R.J.); Blanchland Common (Northd.) both sexes, March 15th, 1913 (R.S.B. & W.L.T.)

CORNICULARIA CUSPIDATA (*Bl.*)

Rather common; Chopwell, Spen Banks, Gibside, Winlaton, Axwell and Blanchland (R.S.B. & W.L.T.)

CORNICULARIA UNICORNIS (*Camb.*)

Both sexes, February and June, 1906, Winlaton (R.S.B.)

CORNICULARIA VIGILAX (*Bl.*)

Blanchland Common, both sexes (A.R.J.); Winlaton, ♀, December, 1905 and ♂'s in February, 1906 (R.S.B.)

WALCKENAERA ACUMINATA (*Bl.*)

Common throughout the area.

WALCKENAERA NUDIPALPIS (*Westr.*)

Gibside, ♀, December, 1905; Winlaton several males in March, 1906 (R.S.B.); two females, Blanchland Common, March 15th, 1913 (R.S.B. & W.L.T.)

WALCKENAERA OBTUSA (*Bl.*)

A very rare British spider. Winlaton, both sexes, December, 1905, January and February, 1906; Gibside, ♂, March 17th, 1906 (R.S.B.)

GONATIUM RUBENS (*Bl.*)

Common.

GONATIUM RUBELLUM (*Bl.*)

Near Winlaton and on Spen Banks (R.S.B.); females only in haystack refuse at Snods, and in moss near Hunstanworth, March, 1913 (R.S.B. & W.L.T.)

ENIDIA BITUBERCULATA (*Wid.*)
Common.

ENIDIA CORNUTA (*Bl.*)
By beating hawthorn, yew, etc. in Gibside (R.S.B.); Axwell Park, May, 1909 (W.L.T.)

DISMODICUS BIFRONS (*Bl.*)
Common.

GONGYLIDIUM RUFIPES (*Sund.*)
Common.

OEDOTHORAX FUSCUS (*Bl.*)
Both sexes at Winlaton (R.S.B.); in marshy field at Redwell Hills, 1 ♂, March, 1913 (R.S.B. & W.L.T.)

OEDOTHORAX RETUSUS (*Westr.*)
Both sexes, Winlaton, Gibside, and Axwell (R.S.B.); one ♂ on Blanchland Common (Northd.) and both sexes in haystack refuse on Durham side of Derwent at Blanchland and Bail Hill, near Hunstanworth, and 1 ♂ in marshy field at Redwell Hills in March, 1913 (R.S.B. & W.L.T.)

OEDOTHORAX GIBBOSUS (*Bl.*)
Spen Banks (R.S.B.)

OEDOTHORAX TUBEROSUS (*Bl.*)
Lockhaugh and Spen Banks (R.S.B.)

TMETICUS DENTATUS (*Wid.*)
Lockhaugh (R.S.B.)

GONGYLIDIELLUM VIVUM (*Camb.*)
Taken locally in June, 1906 (R.S.B.)

TYPHOCHRESTUS DORSUOSUS (*Camb.*)
Blanchland Common, ♀'s only, June, 1903 (A.R.J.)

ERIGONE DENTIPALPIS (*Wid.*)
Common.

ERIGONE PROMISCUA (*Camb.*)
Winlaton, June, 1906, ♂ (R.S.B.)

ERIGONE ATRA (*Bl.*)

Winlaton Mill (R.S.B.) and females at Blanchland in September, 1910 (W.L.T.)

ERIGONE ARCTICA (*White*) var. MARITIMA (*Kulcz.*)

In a wood near Winlaton; generally regarded as a seaside form. (R.S.B.)

MASO SUNDEVALLII (*Westr.*)

Common.

HILAIRA EXCISA (*Camb.*)

Females only, Winlaton and Gibside, in December, 1906, and Gibside, April, 1913 (R.S.B.)

HILAIRA FRIGIDA (*Thor.*)=*montigena* (*C.L.K.*)

Single female example taken locally, an unexpected capture (R.S.B.)

LEPTOTHRIX HARDII (*Bl.*)

Both sexes, Blanchland Common (Northd.) (A.R.J.); Blanchland Common (Northd.), 1 ♀, March 15th, 1913 (R.S.B. & W.L.T.)

LEPTOTHRIX HUTHWAITII (*Camb.*)

Amongst rushes in swampy field, Lockhaugh (R.S.B.)

OREONETIDES ABNORMIS (*Bl.*)

Females, Winlaton, December, 1905, and June, 1906, and under stone by Derwent banks at Swalwell, March, 1911, and Gibside (R.S.B.)

OREONETIDES FIRMUS (*Camb.*)

In a wood near Winlaton and at Gibside (R.S.B.)

MACRARGUS RUFUS (*Wid.*)

Common throughout valley.

MENGIA SCOPIGERA (*Grube*).

Gibside, females only, December, 1905 (R.S.B.)

CENTROMERUS PRUDENS (*Camb.*)

Single females, Blanchland (Northd.) July and February (A.R.J.); Blanchland Common (Northd.) March 15th, 1913, and 1 ♀ on Cowbyers Fell, and 1 ♀ on Buckshott Moor at about 1,400 feet, March 30th 1913 (R.S.B. & W.L.T.)

CENTROMERUS ARCANUS (*Camb.*)

Gibside, December, 1906, and Winlaton (R.S.B.)

CENTROMERUS SILVATICUS (*Bl.*)

Not uncommon, Gibside, Winlaton, and Axwell (R.S.B. & W.L.T.)

CENTROMERUS EXPERTUS (*Camb.*)

Females in a swampy wood near Winlaton in January 1906 (R.S.B.)

CENTROMERIA BICOLOR (*Bl.*)

Common throughout area.

CENTROMERIA CONCINNA (*Thor.*)

Common throughout the area.

PORRHOMMA PYGMÆUM (*Bl.*)

Females, Winlaton, December, 1905; Axwell, March, 1906 (R.S.B.)

PORRHOMMA PALLIDUM (*Jackson*).

Both sexes, Gibside, April 12th, 1913 (R.S.B.) It is possible that the following records under *oblongum* (*Camb.*) refer to this new species.

PORRHOMMA OBLONGUM (*Camb.*)

Spen Banks, ♀, January, 1906 and Gibside in April, 1906, both sexes (R.S.B.)

PORRHOMMA MICROPHTHALMUM (*Camb.*)

One female, shingle bed near Winlaton Mill, June, 1906 (R.S.B.) Also taken in moles' nests at Bradbury, March, 1911, and in puffins' nests, Farne Islands, September, 1911 (W.L.T.)

PORRHOMMA EGERIA (*Sim.*)
Two ♀'s, under stone embedded in sandy ground on Derwent banks at Ladies' Steps, near Swalwell (H.S.W. & R.S.B.)

SINTULA CORNIGERA (*Bl.*)
Winlaton, males, December, 1906, and April, 1907, and Spen Banks, January, 1906 (R.S.B.)

CORYPHAEUS SIMPLEX (*F. Camb.*)
A single example of this rarity was found under a stone on the river banks at Eddies' Bridge, near Edmundbyers, March 29th, 1913 (R.S.B.)

AGYNETA CONIGERA (*Cb.*)
Gibside (R.S.B.)

AGYNETA DECORA (*Cb.*)
Winlaton (R.S.B.)

MICRYPHANTES RURESTRIS (*Koch*).
Winlaton, December, 1905, males (R.S.B.)

MICRYPHANTES SAXATILIS (*Bl.*)
Not uncommon.

RHABDORIA DILUTA (*Camb.*)
Winlaton, ♀, December, 1905; ♂, April, 1907; Spen Banks, females, January, 1906 (R.S.B.); in haystack refuse at Bail Hill, near Hunstanworth, March 30th, 1913 (R.S.B. & W.L.T.)

MICRONETA VIARIA (*Bl.*)
Probably common; Winlaton, both sexes in December, 1906, and Axwell (R.S.B.); Blanchland (Northd.), September, 1910 (W.L.T.)

MICRONETA GULOSA (*Koch*)—*sublimis* (Cb.)
Not rare on Blanchland Common (Northd.) where adults may be found in June and July (A.R.J.); Buckshott Moor, 1 ♂ at 1,400 feet, March 30th, 1913 (W.L.T.)

BATHYPHANTES NIGRINUS (*Bl.*)
Plentiful.

Bathyphantes gracilis (*Bl.*)

Common.

Bathyphantes approximatus (*Camb.*)

Spen Banks (R.S.B.)

Bathyphantes concolor (*Wid.*)

Common throughout valley.

Poeciloneta globosa (*Wid.*)—*Bathyphantes variegatus* (Bl.)

Winlaton, December, 1906; Gibside and Axwell (R.S.B.)

Leptyphantes ericæus (*Bl.*)

Common.

Leptyphantes pallidus (*Camb.*)

Gibside, females in moss of waterfalls with *Meta merianæ*, January, 1906 onwards. Cellar, April, 1913, both sexes, Gibside (R.S.B.); Lockhaugh, May, 1911 (W.L.T.)

Leptyphantes obscurus (*Bl.*)

By beating conifers, both sexes on March 16th, 1913, at Hunstanworth (R.S.B. & W.L.T.)

Leptyphantes Mengii (*Kulzc.*)

Winlaton, January, 1906, female (R.S.B.)

Leptyphantes tenuis (*Bl.*)

Very common.

Leptyphantes Zimmermani (*Kulcz.*)

Common throughout area.

Leptyphantes cristatus (*Menge*).

Not uncommon.

Leptyphantes alacris (*Bl.*)—*terricola* (*K.*)

Gibside, males, January, 1906, and both sexes later (R.S.B.); Chopwell, May, 1910, numerous amongst grass and dead leaves (W.L.T.)

Leptyphantes leprosus (*Ohl.*)

Winlaton, females, December, 1905, and Lockhaugh, male, April, 1906 (R.S.B.); in a cellar at Edmundbyers, March 16th, 1913 (R.S.B. & W.L.T.)

LEPTYPHANTES MINUTUS (*Bl.*)

Common at Winlaton, Gibside, and Axwell Park (R.S.B. & W.L.T.)

LABULLA THORACICA (*Wid.*)

Young from Gibside, January, 1906 and April, 1913 (R.S.B.); females in loose moss on Durham side of Derwent at Blanchland, March 16th, 1913 (R.S.B. & W.L.T.) in all cases with *Meta merianæ*.

LINYPHIA CLATHRATA (*Sund.*)

Common.

LINYPHIA MONTANA (*Clerck*).

Winlaton in an outbuilding (R.S.B.); one immature ♀ by beating gorse at Eddies' Bridge, near Edmundbyers, March, 1913 (R.S.B. & W.L.T.)

LINYPHIA TRIANGULARIS (*Clerck*).

Common.

LINYPHIA PELTATA (*Wid.*)

Common throughout area.

LINYPHIA PUSILLA (*Sund.*)

One young ♀ by beating gorse, Eddies Bridge, March 29th, 1913 (R.S.B. & W.L.T.)

LINYPHIA HORTENSIS (*Sund.*)

Both sexes, Gibside, January, 1906 (R.S.B.)

LINYPHIA INSIGNIS (*Bl.*)

Gibside, Winlaton and Winlaton Mill, December, 1905 (R.S.B.); Axwell Park, Swalwell, August, 1909 and June, 1910 (W.L.T.)

DRAPETISCA SOCIALIS (*Bl.*)

Common everywhere on tree trunks—especially on trees covered with *Cryptococcus viridis*.

STEMONYPHANTES LINEATUS (*L.*)

Common everywhere.

BOLYPHANTES LUTEOLUS (*Bl.*)

Common everywhere.

BOLYPHANTES ALTICEPS (*Sund.*)

Winlaton Mill, ♀, August, 1911 (W.L.T.), and in haystack refuse, Hunstanworth, March, 16th 1913 (R.S.B. & W.L.T.)

TAPINOPA LONGIDENS (*Wid.*)

Common at Winlaton, Axwell Park, and Gib de (R.S.B. & W.L.T.)

SUB-FAMILY II.—TETRAGNATHINÆ.

EUGNATHA STRIATA (*C.L.K.*)

Gibside, spring, 1909, 1 young ♀. A very rare species, previously recorded from Dorset, Norfolk, and Sligo. My example occurred with two other unexpected spiders *Dictyna variabilis* and *Ballus depressus*, in a marshy spot in Gibside West Woods (R.S.B.)

PACHYGNATHA DE GEERII (*Sund.*)

Common, Gibside, Axwell, Winlaton, Hollinside, Hunstanworth and Blanchland (Northd.)

PACHYGNATHA CLERCKII (*Sund.*)

Winlaton, Axwell, Gibside, Hunstanworth, and Blanchland (Northd.) (R.S.B. & W.L.T.)

PACHYGNATHA LISTERII (*Sund.*)

A rare spider. Axwell, March 29th, 1906, and further examples, both sexes, at Winlaton and Gibside in haystack refuse (R.S.B.) ; in Axwell, haystack, May, 1909, adult male (W.L.T.)

TETRAGNATHA SOLANDRII (*Scop.*)

On long grasses at edge of wood near Winlaton, summer, 1905 (R.S.B.)

TETRAGNATHA EXTENSA (*L.*)

Two young examples taken in long grass in a ditch at edge of moor, Shildon Burn, on March 30th, 1913, are almost certainly referable to this species (W.L.T.)

Meta segmentata (*Clerck*).
Common.

Meta Merianæ (*Scop.*)
From moss, rushes, etc., in shady places. Evidently common throughout valley (R.S.B. & W.L.T.)

Nesticus cellulanus (*Clerck*).
In long hanging grass by a waterfall in Gibside, January, 1906, and common in an old well at Winlaton, March, 1907 (R.S.B.)

Sub-Family III.—Argiopinæ.

Zilla x-notata (*Clerck*).
Common.

Zilla atrica (*Koch*).
Gibside (R.S.B.)

Cyclosa conica (*Pall.*)
Immature male, 1906, Winlaton (R.S.B.); immature males, May, 1909, Axwell (W.L.T.)

Epeira cucurbitina (*Clerck*).
June, 1906, Gibside (R.S.B.); Shildon Burn, Hunstanworth and Roughside, March, 1 93 (R.S.B. & W.L.T.)

Epeira triguttata (*Fabr.*)
Hunstanworth, June, 1906 (R.S.B.)

Epeira diademata (*Clerck*).
Numerous.

Epeira cornuta (*Clerck*).
Winlaton Mill and Blanchland (Northd.) (R.S.B. & W.L.T.)

Epeira quadrata (*Clerck*).
Blanchland (Northd.), both sexes, September, 1910 (W.L.T.), Gibside, one ♀, August, 1911 (R.S.B.)

Epeira umbratica (*Clerck*).
Several examples under bark of rail posts near water, Axwell Park, June, 1906, and under similar conditions at Gibside, January, 1913 (R.S.B.)

ORDER II.—PHALANGIDEA (HARVESTMEN).

FAMILY PHALANGIIDÆ.

LIOBUNUM ROTUNDUM (*Latr.*)
Not uncommon (R.S.B.)

MEGABUNUS INSIGNIS (*Meade*).
Rather rare, Gibside, Axwell and Winlaton (R.S.B.)

PLATYBUNUS CORNIGER (*Herm.*)
Not uncommon (R.S.B.)

PHALANGIUM OPILIO (*Linn.*)
Very common (R.S.B.)

PHALANGIUM PARIETINUM (*De Geer*).
Not uncommon, chiefly near buildings (R.S.B.)

OLIGOLOPHUS MORIO (*Fabr.*)
Very common (R.S.B.)

OLIGOLOPHUS ALPINUS (*Herbst.*)
Common on the higher parts of the valley (R.S.B.)

OLIGOLOPHUS TRIDENS (*C.L.K.*)
Common (R.S.B.)

OLIGOLOPHUS PALPINALIS (*Herbst.*)
Gibside, Ebchester, Hunstanworth and Blanchland (R.S.B.)

OLIGOLOPHUS AGRESTIS (*Meade*).
Common (R.S.B.)

FAMILY NEMASTOMATIDÆ.

NEMASTOMA LUGUBRE (*Muller*).
Common throughout area (R.S.B.)

NEMASTOMA CHRYSOMELAS (*Herm*).
Common on the moors as well as in the lower reaches of the valley (R.S.B.)

ORDER III.—CHERNETIDEA (PSEUDO-SCORPIONS).

FAMILY CHERNETIDÆ.

When Dr. Randell Jackson's Tynedale Spiders was published (1906) but one false scorpion, the ubiquitous *Obisium muscorum*, was known from the counties of Northumberland and Durham. We now have six records, of which the following three have occurred in the Derwent Valley. Systematic search should increase this list considerably (R.S.B.)

OBISIUM MUSCORUM (*Leach*).

Common and widely distributed, occurring on our highest moors and hills, as well as in the woods and pastures of the valley (R.S.B.)

CHTHONIUS TETRACHELATUS (*Preyss.*)

Under stones and boards, chiefly in gardens, Newcastle, Winlaton and Gibside; one example in bracken refuse, Gibside, April 12th, 1913 (R.S.B.)

CHTHONIUS RAYI (*Koch*).

One example from under a stone, Gibside, June, 1910 (R.S.B.)

6.—ORIBATIDÆ.

p. 152.

(Beetle-mites)

OF THE COUNTY OF DURHAM, WITH SPECIAL REFERENCE TO THE DERWENT VALLEY.

By Rev. J. E. Hull, M.A.

I submit a preliminary list of Durham Oribatidæ at the request of Mr. R. S. Bagnall, to whom nearly the whole of the records are due. He has been assisted, so far as the Derwent Valley is concerned, by Messrs. W. L. Turner and H. S. Wallace; and I have also had a record or two for the Team Valley from Mr. J. W. H. Harrison. I am indebted to some of the junior members of the Club for a sack of material, which if not very rich in species, was nevertheless very welcome. My own collecting was limited to two or three hours on the Durham coast, for the most part simply duplicating observations already made by Mr. Bagnall.

Of the 69 species here enumerated, eight (marked with an asterisk) have not yet been found in the Derwent Valley.

Those marked † require further study and probably include some new species. *Hermannia fluviatilis*, sp. n., is described at the end.

SUB-FAM. ORIBATINAE.

1.—Gen. Pelops.

**P. acromius* (Herm.) ... ... Under stones on the sea banks, Ryhope to Hart.

**P. fuligineus* (Koch) ... ... Wet moss, sea banks, Ryhope, both of these and 2 others, are sure to turn up in the Derwent Valley.

2.—Gen. Oribates (Latr.).

§i.

O. edwardsii. (Nic.) ... ... Damp moss, anywhere.

O. globulus (Nic.) ... ... Largest and commonest of the genus.

O. gracilis (Mich.) ... ... Ground moss, Gibside.

*O. *lapidaria* (Luc.)	Under stones, sea banks, Ryhope.
O. *mollicomus* (Koch)	Moss, lichen, old wood, Gibside, Hart.
*O. *orbicularis* (Koch)	Moss on trees, Hart.
†O. *picipes* (Koch)	On gorse or in dry moss, etc. Ruffside, Eddy's Bridge, near Edmundbyers, Gibside, Fatfield, and Blackhall Rocks.
†O. sp.	As preceding, Gibside.
O. *ovalis* (Koch)	In moss everywhere; Gibside, Hart.
O. *quadricornutus* (Mich.)	Feeds normally on decaying wood but travels fast and so may be found anywhere. Gibside, Bolt Law (the Bolt Law specimens may be another species).
§iii.	
O. *cuspidatus* (Mich.)	Moss, lichen, etc., anywhere. Chopwell, Gibside, Blanchland (Bolt Law and Edmundbyers), Hart and Ryhope, Shildon Burn (Northd.)
O. *dorsalis* (Koch)	Two or three specimens from Gibside and Chopwell. In plenty from the seabanks at Ryhope and Blackhall Rocks under stones.
O. *lucasii* (Nic.)	Old wood, bracken, debris. Gibside, also Shildon Burn near Blanchland (Northd.).
†O. sp.	Moss, Gibside and Hart.
§iv.	
†O. sp.	Sphagnum and wet moss, usually. Gibside, Hart.
O. *fusiger* (Mich.)	I find this commonly in Sphagnum, but it turned up in moss from a pine-wood, Gibside.
O. *avenifer* (Mich.)	Gibside, under log.

SUB-FAM. NOTASPIDINAE.

1.—Gen. CEPHEUS.

**C. tegeocranus* (Herm.)	Ryhope, Hart, and Fatfield. Usually on wood, but turned up in all kinds of material from Hart. It is singular that this species has not yet been met with in the Derwent Valley.

2.—Gen. TEGEOCRANUS.

T. cepheiformis (Nic.)	Feeds normally on decaying wood but turned up in various material from Gibside, Chopwell and Hart.
T. dentatus (Mich.)	Same habitat. Gibside, Chopwell, Birtley and Fatfield.
T. latus (Koch)	Common, usually on wood. Gibside, Chopwell, and Eddy's Bridge, near Edmundbyers, Fatfield.
T. velatus (Mich.)	Earth moss and moss among heather, Gibside. Also in pine needles.

3.—Gen. CARABODES.

C. elongatus (Mich.)	Abundant on rotten wood, Gibside, Chopwell, Fencehouses and Fatfield.
C. fermoralis (Nic.)	On wood, Gibside, Chopwell. Also like many wood-feeders, in moss on trees.
C. labyrinthicus (Mich.)	Moss in heather, Gibside. Also among dead leaves, etc.
†*C.* sp.	On lichens, Gibside.
†*C.* sp.	Very abundant on lichen, Gibside; occasionally on wood.
C. marginatus (Mich.)	A few specimens from moss in heather, Gibside, Old wood Chopwell.

4.—Gen. LIACARUS.

L. coracinus (Koch)	Moss, Edmundbyers, Fatfield.
L. ovatus (Koch)	Moss, gorse debris, etc., Edmundbyers, Gibside, Hart. Also Shildon Burn, near Blanchland (Northd.).

5.—Gen. SCUTOVERTEX.

**S. maculatus* (Mich.)	Under stones, Marsden Rock.

6.—Gen. NOTASPIS.

§i.

N. exilis (Nic.)	Moss; Edmundbyers.
N. similis (Mich.)	Moss, Edmundbyers; moss in heather, Gibside; also Shildon Burn near Blanchland (Northd.).
N. tibialis	Wet moss, Ryhope, Moss in heather, Gibside.
†*N.* sp.	Tree moss, Hart, Gibside.

§ii.

N. bipilis (Herm.)	Abundant everywhere.

§iii.

†*N.* sp.	Moss, Greatham, Gibside.
†*N.* sp.	Moss on wall, Gibside.

§iv.

N. lucorum (Koch)	Lichen, etc., Gibside.
N. oblonga (Koch)	Moss on lichen, Gibside, Blackhall Rocks and Hart.

§v.

**N. clavipectinata* (Mich.)	Moss, Greatham.
N. lanceolata (Mich.)	Moss and sphagnum, Bolt Law, Gibside.
N. splendens (Koch)	Moss, Gibside; sphagnum, Bolt Law; gorse needles, Eddy's Bridge.

N. trigona (Mich.)	Earth moss, Gibside.
†*N.* sp.	Moss, Gibside.
N. longilamellata (Mich.)	Moss, Gibside.

SUB-FAM. DAMAEINAE.

1.—Gen. Damaeus.

**D. nitens* (Koch)	Rare, Greatham and Fatfield.
D. auritus (Koch)	On wood, under stones, etc., Axwell Park, Gibside, Edmundbyers, Fatfield, Ryhope, Blackhall Rocks, Hart and Greatham.
D. clavipes (Herm)	Gibside, Eddy's Bridge, near Edmundbyers, Hart.
D. geniculatus (Koch)	Greatham, Ryhope, Fencehouses, Gibside, Eddy's Bridge, near Edmundbyers.
D. tecticola (Mich.)	Bracken refuse, Gibside.

SUB-FAM. NOTHRINAE.

1.—Gen. Hermannia.

H. arrecta (Nic.)	On wood, Gibside, one example. Another, Chopwell.
H. bistriata (Nic.)	Semi-aquatic, generally found in wet moss or sphagnum. Bolt Law, Gibside, Ryhope, and Blackhall Rocks.
H. convexa (Koch)	Usually on wood, but I have found it plentifully in all kinds moss, and also among pine-needles. It appears to be singularly uncommon in the Derwent Valley. Gibside, Ryhope, and Hart.
H. fluviatilis, sp. n.	Water-moss, Gibside, 2 or 3 specimens only. Probably amphibious like *N. scalra*. Described herein.

H. nana (Nic.)	Sphagnum, Bolt Law; also Shildon Burn near Blanchland (Northd.).
H. scabra (Koch)	Semi-aquatic. Found in wet moss, Gibside, Ryhope, and Blackhall Rocks. Common under stones, Fencehouses, Penshaw, and Fatfield.

2.—Gen. NOTHRUS.

N. bicarinatus (Koch)	Moss in heather, etc., Gibside, gorse debris, Eddy's Bridge, near Edmundbyers.
N. glaber (Mich.)	Semi-aquatic. Sphagnum on Bolt Law.
N. palustris (Koch)	Normally an inhabitant of damp moss in woods, but found in all kinds of material, from Hart, and on wood, Gibside.
N. segnis (Herm.)	Moss of various kinds, Chopwell, Gibside, also among pine-needles.
N. silvestris (Nic.)	Usually in moss under trees, also in dead leaves and among heather, Gibside.

3.—Gen. HYPOCHTHONIUS.

H. brevis (Mich.)	A very minute yellow species; several examples in rotten wood from a quarry near Penshaw.

SUB-FAM. PHTHIRACARINÆ.

1.—Gen. HOPLODERMA.

H. dasypus (Dug.)	Feeds on decaying wood like all the rest of the sub-family, but turns up in all sorts of places. All localities including Bp. Auckland. A form answering to *H. globosum* (Koch) occurred at Gibside, but I do not think it a distinct species.

†*H.* sp. ... ... This resembles a small *H dasypus* but the pseudostigmatic organ is three times as long and of a different shape, Gibside.

H. magnum (Nic.) ... ... Not so common as *H. dasypus*, but found in all the Derwent Valley localities.

2.—Gen. PHTHIRACARUS.

P. arduus (Koch) ... ... A single example, on wood, Gibside; another later, same locality.

HERMANNIA FLUVIATILIS, sp. n.

Intermediate between *H. convexa* (Koch) and *H. bistriata* (Nic.) but larger than either and of a paler colour, being distinctly brownish above and quite rust-brown beneath. Length circa .9mm.—the largest species of this genus.

There is no definite margin to the dorsum of the abdomen, but the edges are slightly turned up from the shoulder to a short distance beyond the middle. The surface is irregularly pitted, more closely than in *bistriata*, less so than in *convexa*. The dorsal setae have the same arrangement as in *convexa*, but are filiform, acute, adpressed, and so long as to overlap one another. *No setae on the posterior margin different from the rest*, except in being shorter and more curved. The abdomen is somewhat pointed behind.

Cephalothorax finely and closely pitted. Pseudostigmatic setae rod-like, but slightly clavate and pointed. Legs as of *bistriata*, but the thicker hairs are all longer and acute.

Readily distinguishable from *convexa* by the longer and thinner dorsal setae, shorter pseudostigmatic organs, and the partially marginate dorsum of the abdomen; and from *bistriata* by the regularly arched and oval abdomen; from both by the total absence of spatulate setae.

Two specimens: Gibside, moss in stream, April, 1913. (R.S.B.).

Report of the Hope Professor of Zoology, 1913, 1914.

The Reports of the Hope Department written by the present Professor up to and including the year 1912 have been presented to the Delegates of the University Museum and by them submitted to Convocation and brought before the University in the pages of the *Gazette.* The activity of a recently-elected Delegate led, on June 3, 1913, to the appointment of a Committee "to consider the question of the form and contents of these Departmental Reports . . ." Although, as regards the necessity for a long and elaborate report, the Hope Department is in a very different position from all the other Museum Departments except the Pitt-Rivers Museum, the Professor was not invited to any of the deliberations of the Committee. Nor was any opportunity afforded for a full consideration of the Committee's report, which, dated Oct. 22, 1913, was put down for discussion and adoption at the Delegates' Stated Meeting on Oct. 25. At this meeting therefore the Professor was given his first chance of criticising a completed scheme which affected him far more seriously than any other Departmental head. It was a meeting entirely unsuited for the discussion of detail. Seventeen persons were present with 14 items on the agenda, the Committee's Report being only the second on the list. It was of course quite impossible to verify any statements. Thus the Professor said he was confident that his reports had not increased in length during recent years, but that, except for 1912, with special causes in operation, they had on the whole diminished. With this conclusion the promoter of the Committee signified his disagreement. There was no time to get the facts and the Delegates voted without knowing them. Yet the Professor's conclusions were correct, for the five reports from 1903 to 1907 averaged 50 octavo pages, the five from 1908 to 1912 only 40 pages, each.

The above may serve as a sample of a discussion that from the first was bound to be futile, and the Delegates, adopting a custom that is happily rare in this country, condemned the Professor's method without allowing him an effective hearing. To his profound discouragement the Professor has been led to feel that the Delegates have ended a friendly and pleasant association which had endured for twenty years.

1. *The Assistant Curator of the Hope Collections.*

At the end of 1913 Mr. R. S. Bagnall was compelled by pressing business engagements to leave Oxford for a time, and, when the war broke out, he found it impossible to return. In the period of financial stress which then began the Professor did not ask for the appointment of a successor, so that the stipend of the Assistant Curator has become available.

2. *Work done by the Staff.*

On Nov. 15, 1913, Mr. H. Britten was appointed as an assistant, and his great experience with obscure and difficult groups of British insects has proved to be of great value to the Department.

In addition to the large amount of work, implied by the list of accessions in 1913 and 1914, which has fallen upon Mr. A. H. Hamm, Mr. Joseph Collins and Mr. H. Britten, a great deal of time and skill has been expended upon the older parts of the Hope Collections, especially the Coleoptera. It is hoped that gradual progress will continue to be made with the vast accumulation of valuable material.

3. *Work on the Collection of Pierinae.*

During the two years 1913 and 1914 Dr. F. A. Dixey continued his work on the collection of *Pierinae.* He incorporated specimens from the donations of Sir G. Kenrick, Commander J. J. Walker, Dr. G. B. Longstaff, Rev. K. St. A. Rogers, Messrs. C. A. Foster, G. F. Leigh, H. H. Druce, F. C. Woodforde, C. M. Dammers, J. J. Joicey, R. A. Craig, V. G. Bell, R. Evans, D. Watson, R. E. Kunzé, H. Grose Smith, J. C. Moulton, C. Oberthür,

E. R. Speyer, W. Schaus, H. B. Popplewell and Miss D. Wilson. The number of specimens thus added to the collection, many of which were of species previously unrepresented there, was 1087. He worked out series of Pierines sent by Dr. G. D. H. Carpenter from Uganda, by Mr. G. F. Leigh from the Comoro Islands, and by Mr. C. A. Willis from the Nuba Hills west of the White Nile. The following short papers were contributed by him to the Proceedings of the Entom. Soc. Lond.: (1) "On *Tatochila immaculata*", (2) "Mimicry in relation to Geographical Distribution", (3) "Pierids and their scent-scales", (4) "Pierines from Western China". Papers were read by Dr. Dixey at the British Association Meetings at Birmingham and Sydney; on "Geographical Distribution and Mimicry" and on "The Scent-distributing apparatus in certain Papilionines, Pierines and Erycinids," respectively. A paper in which six new species and subspecies of *Pierinae* were described and figured was communicated to the Entom. Soc. Lond., and will be published in a forthcoming volume of the Society's Transactions.

4. *Rearrangement of the British Beetles.*

The remounting and rearrangement of the Hope-Westwood collection of Coleoptera (British) has been continued at intervals during the years 1913 and 1914 by Commander J. J. Walker, who has kindly written the following report: "The insects dealt with in 1913 belong mostly to the smaller and more obscure families of the Clavicorn series, and, as was the case with the *Staphylinidae*, a good many of the specimens, owing to their antiquity, as well as to the practice of the older Coleopterists of pinning nearly every specimen, however minute, have presented much difficulty in successful manipulation. One or two outstanding groups of the series, of which the *Nitidulidae* are the most important, still remain to be taken in hand. Mr. Donisthorpe's excellent specimens have been suitably remounted at the same time.

"Further progress has been made with this collection during the year 1914, and the remounting, &c., is now practically completed as far as the end of the family *Elateridae*. The large and important group of the Brachelytra is now being 'assembled' and the species put into proper sequence, while the numerous specimens from the 'Tylden' and 'Chitty' collections, as well as many species received from Messrs. H. St. J. Donisthorpe, W. Holland, W. E. Sharp and other donors, are being incorporated with those from the Hope-Westwood collection, the whole forming an excellent representative series of these very interesting Coleoptera."

5. *Work on the British Collections of Macro-Lepidoptera.*

For some years Mr. F. C. Woodforde, B.A., Exeter, has given the most generous assistance to this important section of the Hope Department, residing in Oxford and undertaking the rearrangement of the specimens during the winter months, collecting and breeding in various rich localities during the rest of the year. Furthermore, the same generous helper has brought the needs of the Department before many of his friends, who have presented the numerous valuable accessions acknowledged in the later pages of this report. The rearrangement was completed in the early part of 1915, although it is much to be hoped that Mr. Woodforde may be able to continue to visit Oxford and help in the incorporation of fresh material.

The present condition of the Oxford collection of British Macro-Lepidoptera is described as follows by Commander J. J. Walker, Hon. M.A.:—

The rearrangement of the *Macro-Lepidoptera* of this important collection was in 1913 kindly undertaken by Mr. F. C. Woodforde, F.E.S., who has now brought his task to a conclusion. The original "Hope-Westwood" collection, augmented more than twenty years ago by the Rev. F. M. Spilsbury's large collection of British *Lepidoptera*, includes fine series of several of our rare and extinct species, those of *Chrysophanus dispar* (now numbering 23 specimens), *Nomiades semiargus*, and *Noctua subrosea* being specially noteworthy, besides many specimens of historic interest and some good varieties. The work of rearrangement has become highly desirable by the gift of a large number of specimens of rare and local species by several of our prominent Lepidopterists, and by the presentation to the Museum in recent years of the fine collections made by the late Messrs. A. J. Chitty and H. S. Sellon. All these have now been incorporated; the insects have been "staged" where necessary to an uniform height, and special care has been taken to indicate by distinctive labelling the source of every specimen so far as it can be ascertained. The *Macro-Lepidoptera* now occupy 250 cabinet drawers, of which 48 are appropriated to the butterflies alone. The *Pyrales*, *Pterophori*, *Tortrices*, and *Tineae*, which in 1905 were enriched by the very fine collection of these insects generously presented by Mrs. E. C. Bazett, are contained in about 100 more drawers, and have also been recently arranged by the Museum staff. The entire series of British *Lepidoptera* in the Oxford University Museum, including the historic "Dale" cabinets (*cf.* Ent. Mo. Mag., 1907, pp. 93, 130, 154; 1909, pp. 106, 179), now forms one of the finest reference collections in existence, and is readily accessible to all students of the Order. (Ent. Mo. Mag., Mch., 1915, p. 126.)

6. *The Visit of the British Association to Australia.*

Dr. Dixey and the Professor took part in this expedition and were able to bring back large numbers of specimens for the Department. Furthermore Australian naturalists in correspondence with the Professor are undertaking observations, some of which have already led to very interesting results.

7. *Visits of Naturalists, and assistance in working out the material of the Department.*

The annual gathering of entomologists took place in 1913 but was prevented in the following year by the Australian meeting of the British Association. The following Officers and Members of the Council of the Entomological Society were present July 5—7, 1913:—Rev. F. D. Morice, *President*: Commander J. J. Walker and Rev. G. Wheeler, *Secretaries*; G. C. Champion, Dr. F. A. Dixey, F.R.S., J. H. Durrant, Dr. H. Eltringham, A. E. Gibbs, G. A. K. Marshall, W. E. Sharp, and C. J. Wainwright. R. S. Bagnall and W. Borrer were also present. A visit to Boar's Hill was arranged for the afternoon of July 6, when the party was kindly entertained at Youlbury by Sir Arthur Evans, F.R.S. The visit was, as usual, of great benefit to the Department.

The collections were also visited on other occasions during 1913 by the following kind friends:—Mrs. Addison, Sierra Leone; A. Avinoff, Petrograd; Miss Balfour; P. A. Buxton, Trinity College, Cambridge; W. C. Crawley; L. Doncaster, F.R.S.; H. St. J. K. Donisthorpe; Rev. Canon W. W. Fowler; J. A. de Gaye, King's College, Lagos; A. E. Gibbs; F. W. J. Jackson; W. J. Kaye; Ven. Archdeacon G. K. Kestell-Cornish, Ambinanindrano, Madagascar; Guy A. K. Marshall; Prof. R. Meldola, F.R.S.; W. J. von Monté-Pendlebury, Rev. Lake S. Noble, Lagos, S. Nigeria; E. E. Platt, Durban; Prof. R. C. Punnett, F.R.S.; Rev. K. St. Aubyn Rogers, Sagalla, Brit. E. Africa; Hugh Scott, Trinity College, Cambridge; W. E. Sharp; Miss Agnes W. Thomson; R. T. Turley, Mukden, Manchuria; C. B. Williams; Miss Diana R. Wilson (Mrs. Fyson); H. I. A. Wimberley, Warri, S. Nigeria.

Before his return to Uganda Dr. G. D. H. Carpenter did a great deal of work in the Department, preparing his paper read before the Birmingham meeting of the British Association, and his three papers in the Trans. Ent. Soc., 1913. Prof. J. F. van Bemmelen of Groningen studied the patterns of Lepidoptera, Sept. 18—22, and has since published a memoir on the subject.

The Department was also visited in 1913 by:—The King of Uganda; Sir James Caird; Dr. H. T. Fernald, Amherst, Mass.; Dr. H. Gadow, F.R.S.; Willoughby Gardner; the late Dr. W. H. Gaskell, F.R.S.; Baron de Haulleville, Director of the Congo Museum, Brussels; Prof. S. J. Hickson, F.R.S.; Prof. S. Ichikawa, Tokyo; Dr. David Starr Jordan; Dr. Norman H. Joy; Sir Ray Lankester, F.R.S.; Alleyne Leechman, Georgetown, Brit. Guiana; J. J. Lister, F.R.S.; F. N. Pierce; W. L. Tower, Chicago; Prof. R. Ramsay Wright.

In 1914 the visitors to the Department were greatly reduced in consequence of the War and the absence of the Professor for the meeting of the British Association in Australia. The collections were nevertheless visited by several naturalists, some of whom remained in Oxford for a considerable time in order to study them.

Col. J. W. Yerbury very kindly came to reside in Oxford from Feb. 28 till March 18 in order to continue his generous help with the collections of Diptera. He incorporated large numbers of *Asilidae* from the Bigot collection presented by J. E. Collin, and worked out a large series of the same flies collected with their prey at Chirinda, S.E. Rhodesia, by C. F. M. Swynnerton.

Dr. R. Hanitsch, Curator of the Raffles Museum, Singapore, studied the *Blattidae* daily for many weeks, and was enabled to determine numbers of Eastern species by comparison with the collection worked out and arranged by the late R. Shelford.

For some weeks before sailing for Australia on June 22, the Professor worked with C. A. Wiggins upon the great collection made and presented to the University by this generous donor and indefatigable naturalist; and, but for the long anticipated meeting of the British Association they would probably have completed their joint memoir on mimicry in the forest butterflies of Uganda.

The same cause prevented the Professor from meeting another generous donor, W. A. Lamborn, who paid many visits to the Department in the summer in order to study his fine collection recently made at Moor Plantation, near Ibadan, S. Nigeria, and to prepare for publication his record of observations on the Hymenoptera in this locality.

In addition to other short visits C. F. M. Swynnerton, another kind helper with African material, lived in Oxford for nearly a month, towards the end of 1914, in order to study his immense mass of material from Chirinda, in the preparation of an important memoir on insect bionomics.

In addition to the above, the following friends came to see the collections or to work upon them:—The Rev. J. W. B. Bell; G. C. Champion; L. Doncaster; C. O.

Farquharson; F. W. J. Jackson; Dr. F. W. Jackson; the Ven. Archdeacon G. K. Kestell-Cornish; G. A. K. Marshall; S. A. Neave; M. A. Pallis; J. W. Peed; Dr. R. C. L. Perkins; L. B. Prout; H. Rowland-Brown; Miss Agnes W. Thomson.

The Department was also visited in 1914 by:—Prof. S. J. Hickson; Dr. Norman H. Joy; Dr. J. P. Lotsy, Haarlem; Hon. Paul A. Methuen; Dr. Marett Tims.

8. *Eighth with Appendix, and Ninth Volumes of Hope Reports.*

Two of these volumes, VIII. and IX., were the result of three years' accumulated separata—49 in number. The third, issued as an Appendix to VIII., contains nine large octavo memoirs which appeared gradually over a number of years, one having been published as far back as 1890. Ten memoirs specially concerned with the African Insect fauna make up Vol. IX., while 39 in Vol. VIII. and 9 in its Appendix deal with Insects from various parts of the world. All three volumes were issued together in 1913, the Prefaces being dated July 21.

Sufficient material has accumulated since July, 1913, to make up another volume (X.) and probably sufficient to complete an Appendix, containing small quarto memoirs published from time to time over a much longer period.

9. *Works published in* 1913 *and* 1914.

The papers in the following list are grouped according to subject. Five of them appeared in the early part of 1913 and have already been issued in Hope Reports—four, marked *, in Vol. VIII., one, marked **, in Vol. IX.

The forthcoming Vol. X. will, it is hoped, contain nearly all the remaining papers with the following arrangement. It is possible however that such a volume will be too bulky and that some regrouping may be necessary.

A Remarkable American Work upon Evolution and the Germ Theory of Disease, the Presidential Addresses delivered at the Anniversary Meetings of the Linnean Society of London, May 24, 1913, and May 25, 1914, by the Professor. With an Appendix containing a reprint of G. W. Sleeper's booklet dated 1849. (From Proc. Linn. Soc. Lond., 1912-13, p. 26, and 1913-14, p. 23.)

The term 'Mutation', by the Professor. (From Report, Brit. Assoc., Birmingham, 1913, p. 519.)

Mimicry, by the Professor. (From Report, Brit. Assoc., Birmingham, 1913, p. 518.)

Mimicry between the Genera of certain African Nymphaline Butterflies, by the Professor. (From Report, Brit. Assoc., Birmingham, 1913, p. 519.)

*Mimicry, Mutation and Mendelism, by the Professor. (From Bedrock, Apr., 1913, p. 42.)

Mimicry and the Inheritance of Small Variations, by the Professor. (From Bedrock, Oct., 1913, p. 295.)

The Evolution of Mimetic Resemblance, by the Professor. (From Bedrock, Apr., 1914, p. 34.)

The inheritance of small variations in the pattern of *Papilio dardanus*, Brown, by Dr. G. D. Hale Carpenter. (From Trans. Ent. Soc. Lond., 1913, p. 656.)

The Geographical Relations of Mimicry, by Dr. F. A. Dixey. (From Report Brit. Assoc., Birmingham, 1913, p. 518.)

Pseudacraeas aud their Acraeine Models on Bugalla Island, Sesse, Lake Victoria, by Dr. G. D. H. Carpenter. (From Report Brit. Assoc. Birmingham, 1913, p. 517.)

Pseudacraea eurytus hobleyi, Neave, its forms and its models on Bugalla Island, Lake Victoria, by Dr. G. D. Hale Carpenter. (From Trans. Ent. Soc. Lond.. 1913, p. 606.)

Pseudacraea boisduvali, Doubl., and its models, with especial reference to Bugalla Island, by Dr. G. D. Hale Carpenter. (From. Trans. Ent. Soc. Lond., 1913, p. 646.)

On the Urticating Properties of *Porthesia similis*, Fuess., by H. Eltringham, D.Sc. (From Trans. Ent. Soc. Lond, 1913, p. 423.)

Field Observations on the Enemies of Butterflies in Ceylon, by J. C. F. Fryer, M.A., Fellow of Gonville and Caius College, Cambridge. (From Proc. Zool. Soc. Lond., 1913, p. 613.)

The Enemies of 'Protected' Insects; with special reference to *Acraea zetes*, by Dr. G. D. H. Carpenter. (From Report, Brit. Assoc., Birmingham, 1913, p. 516.)

On the Scent Apparatus in the male of *Amauris niavius*, Linn., by H. Eltringham, F.Z.S. (From Trans. Ent. Soc. Lond., 1913, p. 399.)

Further notes on scents in Butterflies, by Dr. G. B. Longstaff. (From Ent. Month. Mag., 1914, p. 1.)

Mr. W. A. Lamborn's Observation on Marriage by Capture by a West African Wasp. A possible explanation of the great variability of certain secondary sexual characters in males, by the Professor. (From Report, Brit. Assoc., Birmingham, 1913, p. 511.)

Empidae and their Prey in relation to Courtship, by A. H. Hamm. (From Ent. Month. Mag., 1913, p. 177.)

On the Relationship between certain West African Insects, especially Ants, *Lycaenidae* and *Homoptera*, by W. A. Lamborn, M.R.C.S., L.R.C.P., F.E.S., Entomologist to the Agricultural Department of Southern Nigeria. With an Appendix containing Descriptions of New Species, etc., by G. T. Bethune-Baker, Pres. Ent. Soc., W. L. Distant, Harry Eltringham, Prof. E. B. Poulton, J. Hartley Durrant, and Prof. Newstead, F.R.S. (From Trans. Ent. Soc. Lond., 1913, p. 436.)

**The Butterflies of the White Nile: a Study in Geographical Distribution, by Dr. G. B. Longstaff. (From Trans. Ent. Soc. Lond., 1913, p. 11.)

The Geographical Distribution of *Danaida plexippus* L. (*Danais archippus*, F.) with especial reference to its recent migrations, by J. J. Walker. (From Ent. Month. Mag., 1914, pp. 181-193, 224-237.)

Description of a new Species of *Pseudonympha* (*Satyrinae*) from South Africa, by Roland Trimen, Hon. M.A., F.R.S. (From Ent. Month. Mag., 1914, p. 281.)

On new or little-known forms of *Acraea*, by H. Eltringham; with description of a new form of *Acraea encedon*, by the Professor. (From Trans. Ent. Soc. Lond., 1913, p. 407.)

Descriptions of new Species of African Heterocera in the Oxford Museum, by G. T. Bethune-Baker, F.L.S. (From Ann. Mag. Nat. Hist., 1913, p. 62.)

Fourth Supplement to the Preliminary List of the Coleoptera of the Oxford district, by J. J. Walker. (From Report Ashmol. Nat. Hist. Soc. of Oxfordshire, 1914, pp. 62-68.)

Note sur *Lucanides* conservés dans les collections de l'Université d'Oxford et du British Museum, par M. H. Boileau, F.E.S. (From Trans. Ent. Soc. Lond., 1913, p. 213.)

On the Hymenopterous genera *Trichogramma*, Westw., and *Pentarthron*, Riley, by Dr. R. C. L. Perkins, D.Sc. (From Trans. Ent. Soc. Lond., 1913, p. 603.)

A Chalcid Parasite on *Thrips* (Thysanoptera), by R. S. Bagnall. (From Report Brit. Assoc. Birmingham, 1913, p. 531.)

Algunos Neurópteros del Museo de Oxford, por el R. P. Longinos Navás, S. J. (From Bol. de la Soc. Aragon. de Cienc. Nat., Mar., 1914, p. 61.)

Brief Descriptions of new Thysanoptera.—I., by R. S. Bagnall. (From Ann. Mag. Nat. Hist., 1913, p. 290.)

Ditto.—II. (Ibid, 1914, p. 22.)
Ditto.—III. (Ibid, 1914, p. 287.)
Ditto.—IV. (Ibid, 1914, p. 375.)

Fossil Insect in Amber. On *Stenurothrips succineus*, gen. et sp. nov., an interesting Tertiary Thysanopteron, by R. S. Bagnall. (From Geol. Mag., 1914, p. 483.)

On a new species of *Melanothrips* (Thysanoptera) from Tunisia, by R. S. Bagnall. (From Ent. Month. Mag., 1913, p. 263.)

*Notes on some rare Thrips (Thysanoptera) from Scotland, by R. S. Bagnall. (From Scottish Naturalist, 1913, p. 37.)

Descriptions of some new species of British Thysanoptera (Tubulifera), by R. S. Bagnall. (From Ent. Month. Mag., 1913, p. 264.)

Conclusion of above. (From Ent. Month. Mag., 1914, p. 35.)

Some interesting British Insects, by F. W. L. Sladen, R. S. Bagnall, and J. E. Collin. (From Ent. Month. Mag., 1913, p. 171.)

On two species of *Haplothrips* new to the British Fauna, by R. S. Bagnall. (From Ent. Month. Mag., 1913, p. 227.)

Euthrips tamicola, a new species of Thysanoptera from the flowers of the Black Bryony, by R. S. Bagnall. (From Ent. Month. Mag., 1914, p. 273.)

Review of Field Work in 1911, by R. S. Bagnall. (From Ent. Record, 1913, p. 224.)

On the Systematic Position of the Order Protura, by R. S. Bagnall. (From Report Brit. Assoc. Birmingham, 1913, p. 531.)

*Notes towards a Knowledge of the Clyde Myriapoda, by R. S. Bagnall. (From Glasgow Naturalist, 1913, p. 89.)

Lithobius duboscqui, Brölemann, a Centipede new to the British Fauna, by R. S. Bagnall. (From Zoologist, 1913, p. 292.)

The Scottish Symphyla, by R. S. Bagnall. (From Scottish Naturalist, 1913, p. 182.)

*Records of two rare Woodlice from the Forth area, by R. S. Bagnall. (From Scottish Naturalist, 1913, p. 39.)

The Woodlice (Terrestrial Isopoda) of Northumberland and Durham, with Keys to the Genera and Species, by R. S. Bagnall. (From Vale of Derwent's Naturalist's Field Club Trans., 1913, p. 94.)

Extracts from the 'Proceedings of the Entomological Society of London', Feb.—Dec., 1913, containing the following communications:—

a. Feb. 5, 1913.—1. Cocoons of moths from the Lagos district, by W. A. Lamborn. (p. v.)
  2. Sexes of Gonometa subfascia, Walker, by J. A. de Gaye, F.L.S. (p. vii.)
  3. Papilio dardanus, Brown, female form leighi, by the Professor. (p. vii.)
  4. Further synepigonic Pseudacraeas of the eurytus, L., group, bred on Bugalla, in the Sesse Archipelago, by Dr. G. D. H. Carpenter. (p. viii.)
  5. "*Trichogramma*, Westw., probably synonymous with *Pentarthron*, Riley (Hymenoptera)," by Dr. R. C. L. Perkins, read. (p. xii.)

b. March 5, 1913.—1. A collection of Larentia citrata, L. (immanata, Haw.) from Iceland, by L. B. Prout. (p. xvi.)
  2. Disabling and other injuries found in Lepidoptera and their interpretation, by the Professor. (p. xix.)
  3. The sluggishness of the African Lycaenid butterfly Megalopalpus zymna, D. and H., by W. A. Lamborn. (p. xxii.)

c. March 19, 1913.—1. "On the Scent-apparatus of *Amauris niavius*, L.," by H. Eltringham, read. (p. xxiv.)

d. May 7, 1913.—1. Scales of Cnethocampa pityocampa, Schiff, by H. Eltringham. (p. xxxi.)

2. The female forms of Papilio polytes, L., in the Hongkong district, by the Professor. (p. xxxi.)
3. A family of Papilio dardanus, Brown, bred from eggs laid by a planemoides, Trimen, female, by Dr. G. D. H. Carpenter. (p. xxxiii.)
4. Protective Resemblance and Mimicry in the Membracidae, by the Professor. (p. xxxv.)
5. The Cocoons of the Tineid Moth Epicephala chalybacma, Meyrick, by T. Bainbrigge Fletcher. (p. xxxviii.)
6. A Hesperid drinking ink after first moistening it, by Dr. E. P. Poulton. (p. xl.)
7. Wings of Danaine and Euploeine butterflies killed by birds in Ceylon, by C. J. F. Fryer. (p. xl.)

e. June 4, 1913.—1. Tatochila immaculata, Röb., by Dr. F. A. Dixey, F.R.S. (p. xlii.)

2. Apparatus for displaying upper and under surfaces of insects, by Dr. G. B. Longstaff. (p. xlvi.)
3. Bee (Andrena) with beetle larva parasite, by Dr. G. B. Longstaff. (p. xlvi.)
4. The resemblance between the under surface of many species of Melitaea and that of certain Palaearctic Hesperidae, by the Professor. (p. xlvi.)
5. The habits of two Algerian Diptera—an Asilid and an Oncodid, by Dr. Adalbert Seitz. (p. xlix.)
6. A Locustid and a Reduviid mimic of a Fossorial Aculeate in the S. Paulo district of Brazil, by Dr. Adalbert Seitz. (p. l.)
7. Synepigonic series of Papilio dardanus, from parent form planemoides, by Dr. G. D. H. Carpenter. (p. liii.)
8. Abstract of "On the relationship between certain West African Insects, especially Ants, Lepidoptera and Homoptera" by W. A. Lamborn, with Appendix. (p. lvi.)

9. "Supplementary notes on new or little-known forms of Acraea" by H. Eltringham, read. (p. lvii.)

f. Oct. 1, 1913.—1. Haplothorax burchellii, from St. Helena in 1913, by H. F. Bartlett. (p. lviii.)
2. Mimicry in relation to Geographical Distribution, by Dr. F. A. Dixey. (p. lx.)
3. Papilio dardanus, Brown, bred in S.E. Rhodesia, by C. F. M. Swynnerton. (p. lxix.)
4. An imported American Syntomid moth, by Commander J. J. Walker. (p. lxx.)
5. "On the Urticating Properties of Porthesia similis," by H. Eltringham, read. (p. lxxiii.)

g. Oct. 15, 1913.—1. Butterflies from the Sudan, by Dr. G. B. Longstaff. (p. lxxx.)
2. The male Amauris egialea stroking the brands of the hind-wings with its anal tufts, again observed, by W. A. Lamborn. (p. lxxxiii.)
3. Observations on the courtship of a S. Nigerian Lycid beetle, by W. A. Lamborn. (p. lxxxiv.)
4. A lizard attacking Magachile cincta, F., by W. A. Lamborn. (p. lxxxv.)
5. Insects bred from the nests of Hymenoptera Aculeata, by W. A. Lamborn. (p. lxxxv.)

h. Nov. 5, 1913.—1. Thais rumina as a Protected Species, by Dr. G. B. Longstaff. (p. lxxxvii.)
2. An additional observation on the courtship of a S. Nigerian Lycid beetle, by W. A. Lamborn. (p. lxxxviii.)
3. The importance of preserving insects found in coitû, by Dr. G. D. H. Carpenter. (p. lxxxviii.)
4. Observations on various Insects, mostly from Africa, by Dr. G. D. H. Carpenter. (p. xciv.)
5. Abstracts of three papers by Dr. G. D. H. Carpenter "*Pseudacraea eurytus hobleyi*, Neave, &c.", "*Pseudacraea boisduvali*, Doubl., &c." and "The inheritance of small variations in the pattern of *Papilio dardanus*, Brown." (p. ciii.)

i. Nov. 19, 1913.—1. An abnormal pairing between Pierine butterflies of different genera, by E. E. Green. (p. cv.)

2. Pierids and their Scent-scales, by Dr. F. A. Dixey. (p. cx.)

j. Dec. 3, 1913.—1. Mimicry among Swallowtails, and other notes on butterflies at S. Paulo, Brazil, by Miss Diana R. Wilson (Mrs. Fyson). (p. cxix.)

2. Erotylid beetles found in clay cells in S. Nigeria, by C. O. Farquharson, B. Sc. (p. cxxii.)

3. Observations on the Driver ants (Dorylus) of S. Nigeria, by W. A. Lamborn. (p. cxxiii.)

4. Scent apparatus of the male Amauris egialea, by Dr. H. Eltringham, D. Sc. (p. cxxxiii.)

Extracts from the "Proceedings of the Entomological Society of London", Feb.—Dec., 1914, containing the following communications:—

a. Feb. 4, 1914.—1. A collection illustrating the natural history of certain Algerian Diptera, by Dr. Adalbert Seitz. (p. ii.)

2. Further notes on the Driver ants of S. Nigeria, by W. A. Lamborn. (p. v.)

3. The Pierine butterfly Neophasia terlooti, Behr., female, a new N. American mimic of Danaida plexippus, L. (archippus, F.), by the Professor. (p. viii.)

b. March 4, 1914.—1. Suggested protective value of the Cocoon of Lyonetia clerkella, L., by Dr. F. A. Dixey. (p. xv.)

2. A surprising family of Hypolimnas (Euralia) dubia, Beauv., and anthedon, Dbl., from Natal, by E. E. Platt. (p. xvii.)

c. March 18, 1914.—1. Erotylid beetles occupying the clay cells of Aculeate Hymenoptera, by C. O. Farquharson. (p. xxiii.)

2. Ants attendant on the larvae of the Lycaenid—Myrina silenus, F., in S. Nigeria, by C. O. Farquharson. (p. xxiii.)

3. The misleading resemblance between mimetic butterflies and their models, by the Professor. (p. xxiv.)
4. Some details in the relationship between the mimetic and the non-mimetic patterns of Papilio polytes, L., by the Professor. (p. xxv.)
5. The feeding of captive butterflies, by C. F. M. Swynnerton. (p. xxvi.)
6. Note on the larvae of Anaphe panda, Boisd., by C. F. M. Swynnerton. (p. xxx.)

d. Apr. 1, 1914.—1. Pierines from Western China, by Dr. F. A. Dixey. (p. xxxii.)

e. May 6, 1914.—1. Papilionid scent-scales, by Dr. F. A. Dixey. (p. xxxvi.)
2. Tipulid larvae brought to the surface, probably by continued rains, by the Professor. (p. xxxvi.)
3. The resting position of the African Nymphaline butterfly Hamanumida daedalus, F., by W. A. Lamborn. (p. xxxvii.)
4. The habits of the wasp Belenogaster junceus, F., and the attacks of Tachinid flies upon it, in S. Nigeria, by W. A. Lamborn. (p. xxxix.)
5. Observations on the method by which Tachinid flies escape from the mud cells of Eumenes, by W. A. Lamborn. (p. xli.)
6. The growth of fungi on the shelters built over Coccidae by Cremastogaster ants in S. Nigeria, by C. O. Farquharson. (xlii.)
7. The larvae of two species of the Geometrid genus Aletis in the Lagos District, by W. A. Lamborn. (p. l.)
8. Observations in the islands in the N.W. of the Victoria Nyanza, by G. D. H. Carpenter. (p. li.)
9. "New species and subspecies of Pierinae," by Dr. F. A. Dixey, read. (p. lvi.)

f. June 3, 1914.—1. Families reared from the eggs laid by known females of Papilio dardanus.

Brown, at Chirinda, S.E. Rhodesia, by C. F. M. Swynnerton. (p. lvii.)

2. A family containing nine hippocoon and eight dionysus bred from a hippocoon female of Papilio dardanus in S. Nigeria, by W. A. Lamborn. (p. lxiii.)
3. The retention of spaces for the "tails" in the pupae of the tailless females of Papilio dardanus, by W. A. Lamborn. (p. lxvii.)
4. The Mendelian relationships of the female forms of P. dardanus, by the Professor. (p. lxvii.)
5. A large family of Hypolimnas (Euralia) mima, Trim., and wahlbergi, Wallgr., bred from known parents of the wahlbergi form at Durban, by E. E. Platt. (p. lxx.)
6. Description of the early stages of three S. and E. African Danaine butterflies, by E. E. Platt. (p. lxxv.)
7. A family raised from parents belonging to two forms of West African Pyrrhocorid bugs, by W. A. Lamborn. (p. lxxviii.)
8. Euliphyra sjöstedti, Auriv., a correction, by the Professor. (p. lxxviii.)

g. Nov. 4, 1914.—1. Isolated Colonies of Anthrocera (Zygaena) trifolii, and Parasemia plantaginis, by Dr. R. C. L. Perkins, D.Sc. (p. xcv.)

2. Meneris tulbaghia and Scarlet Flowers in S. Africa, by Dr. G. B. Longstaff. (p. xcvii.)
3. The proportion of the female forms of Papilio polytes in North Kanara, by T. R. Bell. (p. xcix.)
4. The male and female of Acraea chilo, Godm., observed in coitû in Brit. E. Africa, by Rev. K. St. Aubyn Rogers. (p. c.)
5. Males of Ceratopogon myrmecophilus, Egger, and Formicoxenus nitidulus, Nyl., on the hillock of Formica rufa, L., near Bournemouth, by A. H. Hamm. (p. c.)

h. Dec. 2, 1914.—1. A movable microscopic stage, by Dr. H. Eltringham. (p. cvi.)
2. An Australian Lycaenid larva resembling the flower of the "Wattle", on which it feeds, by the Professor. (p. cvi.)
3. Observations on Dorylus nigricans Illig., in Damba and Bugalla Islands, by Dr. G. D. H. Carpenter. (p. cvii.)
4. Observation of the epigamic use of its anal brushes by the male Amauris psyttalea, Plötz, in Kome Island, N.W. Victoria Nyanza, by Dr. G. D. H. Carpenter. (p. cxi.)
5. "Further Observations on the Structure of the Scent-organs in certain Brush-bearing Male Butterflies," by Dr. H. Eltringham, read. (p. cxii.)

The following papers, also published in the years 1913 and 1914, are of large octavo or quarto size and therefore cannot be included in one of the regular volumes of Hope Reports. Added to memoirs of similar sizes published in earlier years they will be issued as an Appendix to Vol. X. Miss Foot and Miss Strobell have kindly permitted the inclusion of their important memoir towards which Dr. Eltringham contributed a valuable piece of work carried out in the Hope Department. Mr. C. B. Williams has kindly presented the types of the new Thysanoptera described in his two memoirs.

President's Introductory and Final Addresses to the Second Entomological Congress, Oxford, 1912, by the Professor. (From Trans. Second Ent. Congr., 1912, pp. 19, 125, and 129.)

Mimicry in North American Butterflies: A Reply, by the Professor. (From Proc. Acad. Nat. Sci. Phila., 1914, p. 161.)

Pellets ejected by Insect-eating Birds after a meal of Butterflies, by C. F. M. Swynnerton. (From Trans. Second Ent. Congr., 1912, p. 351.)

On the scent-patches of the *Pierinae*, by Dr. F. A. Dixey. (From Trans. Second Ent. Congr., 1912, p. 336.)

W. A. Lamborn's Breeding Experiments upon *Acraea encedon* (Linn.), in the Lagos district of West Africa, 1910—1912, by the Professor. (From Linn. Soc. Lond. Journ.—Zool., 1914, p. 391.)

Results of Crossing *Euschistus variolarius* and *Euschistus servus* with reference to the Inheritance of an Exclusively Male Character, by Katharine Foot and E. C. Strobell. (From Linn. Soc. Lond. Journ.—Zool., 1914, p. 337.)

Thysanoptera of the Abor Expedition, by R. S. Bagnall. (From Records of the Indian Museum, Vol. VIII., Pt. III., No. 13, 1913, p. 201.)

On two new Species of Thysanoptera from the West Indies, by C. B. Williams, B.A., John Innes Horticultural Inst., Merton, Surrey. (From Journ. Econ. Biol., 1913, p. 209.)

A Synopsis of the Thysanopterous Family *Aeolothripidae*, by R. S. Bagnall. (From Trans. Second Ent. Congr., 1912, p. 394.)

Notes on *Aeolothripidae*, with Description of a new Species, by R. S. Bagnall. (From Journ. Econ. Biol., 1913, p. 155.)

Records and Descriptions of British Thysanoptera, by C. B. Williams. (From Journ. Econ. Biol., 1913, p. 216.)

Further notes on new and rare British Thysanoptera (Terebrantia) with Descriptions of New Species, by R. S. Bagnall. (From Journ. Econ. Biol., 1913, p. 231.)

Ceratothrips britteni, n. sp., a type of Thysanoptera new to the British Fauna, by R. S. Bagnall. (From Journ. Econ. Biol., 1914, p. 1.)

The British Species of the Genus *Tetracanthella* (Collembola), by R. S. Bagnall. (From Journ. Econ. Biol., 1914, p. 5.)

On the Classification of the Order Symphyla, by R. S. Bagnall. (From Linn. Soc. Lond. Journn. —*Zool*., 1913, p. 195.)

ADDITIONS TO THE COLLECTIONS.

The form of the following pages differs in some respects from that adopted in previous Reports, the changes being in the direction of greater simplicity and brevity. In these alterations the Professor has been greatly helped by the kind advice of Dr. G. B. Longstaff.

Unless otherwise stated in the following account of additions to the collections 1901—1914, it may be assumed that the captures were effected in the year of presentation and that the donor was the captor.

ADDITIONS TO THE COLLECTIONS IN 1901.

One hundred and twenty-three insects, chiefly Hymenoptera Aculeata, Denmark, N.E. Zeeland; 1 beetle, Helsingborg, Sweden——the Professor.

Nineteen insects taken at the same time and the former locality——E. P. Poulton, M.A., D.M., Balliol.

Eighteen insects, chiefly Coleoptera, Heligoland and the neighbouring Düne I., together with 30 Hymenoptera Parasitica of 2 species, with their cocoons, and the Lepidopterous larva, Heligoland, from which they emerged——the Professor.

Two Coleoptera, Düne Island——E. P. Poulton.

A long series of a very common Acridian (grasshopper) captured on Heligoland and the Düne I.——the Professor and E. P. Poulton. All specimens from the former are dark reddish brown like the soil of the flat top of Heligoland, those from the latter either sand-coloured or green, thus resembling the only surface features of the Düne. This colour harmony, to which there were no exceptions, renders it probable that the species is sensitive to some stimulus supplied by the tints of its natural environments. A brief account of these specimens is published in "Essays on Evolution," Oxford, 1908, p. 307.

Seventeen butterflies from Ospedaletti, near San Remo (April)——Hugh Richardson.

Sixty-nine insects of various orders and 4 spiders from the neighbourhood of Funchal, Madeira——H. B. Gray, of the Linacre Department. Also 7 *Eristalis tenax* and 7 examples of its model *Apis mellifica* taken together on the Pico da Cruz near Funchal.

ADDITIONS TO THE COLLECTIONS IN 1905.

The following collections of Malayan insects (of many orders), presented by the late R. Shelford, M.A., Emmanuel College, Cambridge, have only recently been incorporated although they have been pinned and labelled for a long time:—143 from the Buitenzorg Botanical Gardens, W. Java; 146—Menado, Macassar, and Gorontalo, Celebes; 14—Ternate; 11—Bochling, Bali; 16—Ampenan, Lombok.

ADDITIONS TO THE COLLECTIONS IN 1906.

Twenty-seven insects of various groups and 1 Arachnid, captured by S. S. Flower near Roseires, Blue Nile——the Egyptian Government Zoological Gardens.

Sixty-one butterflies of various sub-families, Moa I., South-West Islands, N.E. of Timor——G. C. Griffiths. The locality renders the specimens of much interest and value.

The following interesting series of moths from the Yorkshire district, illustrating the local development of melanism in that area, was presented by G. T. Porritt of Huddersfield, who has done so much valuable work on this subject:—12 melanic *Phigalia pedaria* (*pilosaria*) bred from a Huddersfield melanic male and normal female from an unknown locality; 10 melanic and 8 typical *Odontopera bidentata* from ova from S.W. Yorkshire; 10 melanic and 4 normal *Boarmia repandata* from ova from the Huddersfield neighbourhood; a variable series of 13 *Larentia multistrigaria* either captured or bred, Huddersfield. An interesting comparison is afforded by 4 melanic *Hemerophila abruptaria* from the eggs laid by a melanic female from Upper Holloway.

ADDITIONS TO THE COLLECTIONS IN 1907.

Thirty-two beetles from Massarang Mt. (3-4000 ft.), N. Celebes (1895), collected by Charles Hose, Hon. D.Sc., Cantab.——the Linacre Department.

A fine *Nemoptera* from Cnidus, S.W. Asia Minor——W. Warde Fowler, M.A., Lincoln College.

Five insects, including an Asilid and its prey, a moth, forest near Aachen——the Professor.

Four *Cimex lectularius*, Sarawak, Borneo——The Principal Medical Officer.

An orange-coloured variety of the Noctuid moth *Bryophila perla*, St. Helen's, Isle of Wight——R. W. Poulton Palmer, B.A., Balliol.

Twelve examples of the beetle *Silvanus surinamensis*, in biscuits from China——Messrs. Huntley & Palmers.

A yellowish, strongly marked female *Pieris napi* (May), and the Noctuid moth *Luperina testacea*, Oxford district ——A. H. Hamm, of the Hope Department.

Twenty-eight specimens of the Galerucid beetle *Lochmaea suturalis* from the crop of *Tetrao tetrix*, Argyllshire ——F. Menteith Ogilvie, M.A., M.B. (Proc. Ent. Soc., Lond., 1907, p. lxxxiv).

ADDITIONS TO THE COLLECTIONS IN 1909.

A fine collection of 789 butterflies, S.E. Congo Free State (Feb.—Nov., 1907)——S. A. Neave, M.A., B.Sc., Magdalen. The area includes Kambove, Katanga, and many localities at various elevations in the valleys of the Lualaba, Lufira, Dikulwe, and Bunkeya Rivers. Among the specimens are co-types of the Danaine, *Amauris lobengula katangae*, the Pierines *Belenois picta* and *B. crawshayi lata*, and the Hesperid *Cyclopides kambove*, all described by Mr. Neave in Proc. Zool. Soc., 1910.

Other species much wanted by the University Collection, and many of them new to it, are *Amauris hyalitis dammfelti*, *Diestogyna iris* (a fine series), *Crenis trimeni*, *consors*, *amelia*, *occidentalicum*, *pechueli*, together with the beautiful mimic of the last-named, viz. *Crenidomimas concordia*, *Precis touhilimasa* and *actia* (a fine series of both), *Vanessula milca*, *Alaena oberthüri*, *Zeritis sorhageni*, *Papilio almansor*, and *Cyclopides formosus*. The locality adds greatly to the interest and value of the specimens.

A nearly equally fine set of 670 butterflies, N.E. Rhodesia (Sept.—Nov., 1908)——S. A. Neave. These butterflies form the remainder of the splendid collection of which part was acknowledged in the Report of 1909, where an account of the localities is given. Those now acknowledged and incorporated include the type of the Nymphaline *Euptera elabontas mweruensis*, of the *Lycaenidae*,—*Catochrysops cupreus* (co-types), *Lycaenesthes gemmifera* (type and co-type), *Deudorix bemba* (♀ type), types of the following *Hesperidae*,—*Platylesches lamba*, *Abantis lofu*, *Sarangesa nox*, *Parnara saxicola*. In addition to these specimens, of inestimable value to the systematist, a large proportion of the remainder are greatly wanted as species and the whole of them because of their interesting localities and admirably precise data.

Sixty-seven African *Chrysididae*, chiefly from the same localities as the above donation——S. A. Neave. This interesting series collected by the donor in his 1907 and 1908 journeys in N. Rhodesia and Katanga, has been kindly named by Rev. F. D. Morice. The most interesting species are *Chrysis* sp. ? *nasuta*, and *Hedychrum coelestinum*.

The non-mimetic male-like and the two mimetic females of *P. polytes*, together with the models of the latter, Ceylon——Prof. R. C. Punnett, M.A., F.R.S.

Two Lepidoptera, Taungdwingyi, Upper Burma, and 1 moth, Rangoon (1908)——E. F. Thornewill.

Eighty Diptera, W. Mersea, Essex——W. Wesché.

ADDITIONS TO THE COLLECTIONS IN 1910.

A fine collection of 1488 insects and 2 other Arthropoda, New Zealand (Jan.—Mch.)——G. B. Longstaff, M.A., D.M., New College, F.R.C.P. The collection was made in a great variety of localities in both North and South Islands, all the specimens being accompanied by admirable data. Lepidoptera form the chief part of the donation—106 butterflies and 846 moths, many of the latter being taken at "Sugar". The general facies of the moths and some of the butterflies is distinctly northern, perhaps to be accounted for by migration by means of the north-and-south mountain ranges of America and then by the Antarctic islands or continent. The fauna is so remarkable that a separate collection is being formed to illustrate it so that the species may be studied as a whole. A nearly complete series of butterflies had already been thus set aside from the collection presented some years ago by Commander J. J. Walker, and to this, 3 specimens of a Lycaenid were now added, while a representative collection of moths has been begun with 232 examples divided between 148 species. The names have been clearly printed and the whole collection is most conveniently arranged for study. Of the other insect groups the Coleoptera are represented by 167 specimens, Rhynchota 97, Orthoptera 84, Hymenoptera 80, Diptera 69, and Neuroptera 35. A Cicindelid beetle with its Forficulid prey and a Locustid devouring a moth, have been added to the bionomic collection.

One hundred and seventy-six insects, Australia (Mar., Apr.)——G. B. Longstaff. Localities in West Australia, South Australia, Victoria and especially New South Wales are represented. The Lepidoptera, 107 butterflies and 27 moths, were chiefly collected. Two examples of *Asilus discutiens*, each carrying the honey-bee as prey, have been added to the bionomic collection.

The following insects captured on the voyage out were also presented by Dr. Longstaff:—Tenerife (Dec. 16, 1909)—10; Cape Town (Dec. 31—Jan. 1)—11; on board ship in Indian Ocean (Jan. 8)—3 examples of the cockroach *Phyllodromia germanica*; Tasmania (Jan. 19—20 and again on Apr. 8—9)—83; and on the voyage home Ceylon (Apr. 27)—12, Aden (May 5)—7.

Twelve Orthoptera from the neighbourhood of Kuching, Borneo——the late R. Shelford.

A valuable series of Orthoptera (15 *Blattidae* and 10 *Phasmidae*)——the Paris Museum of Natural History. The type of the interesting cavernicolous cockroach *Alluaudella cavernicola* is included, together with co-types of 2 other Blattids and 3 Phasmids.

Twenty-four Lepidoptera from various localities in Algeria (Mch., Apr.) and 8 from Mürren, Bernese Oberland (July, Aug., 1907)——H. M. Wallis.

The following series of local forms bred by the donors at S. Woodford, N.E., were presented by the late A. Harrison and Hugh Main, B.Sc.:—

(1) Two males and 4 females of *Pieris napi* from 3 families each reared from eggs laid by a female of the var. *bryoniae*, Simplon (1907). The larvae were bred from the egg and the 12 female butterflies, which emerged May, 1908, are indistinguishable from characteristic Swiss *bryoniae*, the 6 males being typical *napi*, as in Switzerland. (2) Four *P. napi* from eggs laid at Enniskillen (1907); the butterflies, which emerged in July, are characteristic Irish forms. (3) Twelve *Aplecta nebulosa*—viz. 3 of the type form, 4 of the var. *robsoni*, 5 of the var. *thompsoni*—from ova or wild larvae, Delamere Forest, Cheshire (1907-9). (4) Two melanic *Odontopera bidentata*, from ova or small larvae, Horbury, near Wakefield (1908). These experiments in breeding show that the local forms are truly hereditary and not due to the direct action of the local surroundings; for they all kept true when reared amid the influences of a different environment. For this and other reasons the donation is a valuable addition to the University Collection.

Three examples of the huge flea *Hystricopsylla talpae* and 13 small fleas, from a mouse's nest made of feathers, Wytham Park, near Oxford (Apr.)——Commander J. J. Walker, late R.N., Hon. M.A.

ADDITIONS TO THE COLLECTIONS IN 1911.

Thirty-eight of the Nymphaline butterfly *Araschnia levana* with their pupa-cases, bred in Oxford (July), from young larvae from Mecklenburg——F. E. Merrifield.

Sixty-five Odonata and 5 Lepidoptera from various localities in Switzerland; 8 Odonata captured by P. J. Barraud at Itri, S. Central Italy (1910); 19 Odonata from Biskra, Algeria; 47 Odonates, 18 butterflies and 1 Hymenopteron from various localities in Newfoundland——E. R. Speyer, B.A., New College. An important addition to the fine collection of dragonflies in the Department.

Eighteen moths from Mortehoe, N. Devon——G. B. Longstaff. A part of the fine collection of insects from this locality, acknowledged in an earlier Report.

The wings of the Meadowbrown Butterfly (*E. janira*) found close together on the sand-dunes, Pendine, Caermarthenshire——R. I. Pocock, F.R.S., who believed that the insect's body had probably been eaten by a Wheatear.

The Noctuid moth *Cucullia umbratica*, with a pollen-mass of *Orchis maculata* attached, found on a post at Onich, Inverness-shire (Aug. 1909)——Prof. R. Meldola, F.R.S. ("Entomologist," 1909, p. 281; 1910, p. 106, f. 2.)

Ninety-three Platypezid flies, belonging to 4 species determined by F. W. Edwards, Sheviock, nr. St. Germans, Cornwall——Col. J. W. Yerbury. Also a spider taken in the Oxford Univ. Museum (1902).

The three following donations are from St. Helen's, Isle of Wight:—

One *Lycaena icarus* (the Common Blue) with an injury, observed before capture, to the costal margins of both fore wings——C. A. Wiggins.

A dragonfly——Dr. E. W. Ainley Walker, D.M., University.

Five insects from St. Helen's and Oxford——the Professor.

The following donation is almost entirely, the remaining 1911 donations entirely, from the Oxford district:—

Forty-eight insects of various groups (1907-11)——A. H. Hamm. The series includes 4 *Setulia grisea*, a Tachinid fly new to Great Britain (E. M. M., 1909, p. 273), from near Beaulieu Rd. Station (1909); 11 *Brachycoma devia*, with their puparia, bred from the nest of the humble-bee, *Bombus harrisellus*, Day's Lock, Dorchester; 2 mole-fleas, *H. talpae, in coitû*, the male and female types of the variety *flava*, Hamm, of *Sitaris muralis*, Cowley (1909); 2 butterflies, *Polyommatus phlaeas* and *Coenonympha pamphilus*, with injuries, noted before capture, probably caused by birds.

A Death's Head Hawkmoth (*A. atropos*) from New Marston (Sept. 13)——Mrs. Austin. The moth was flying round a lamp in the house.

A Privet Hawkmoth (*S. ligustri*) at rest on the wall of All Soul's and attacked by a sparrow——F. Waller. The attack was seen by the donor.

The hind wings of a Yellow Underwing Moth (*T. pronuba*) eaten by a sparrow (1910)——H. Eltringham, M.A., D.Sc., New College. Attack also witnessed by the donor.

Two beetles, *Donacia sericia*, from the R. Cherwell——G. C. Hartley.

A Syrphid fly, *Merodon equestris*, and a beetle, *Blaps*, with a parasitic *Gordius*——W. Holland.

Five Hemiptera, *Anthocoris nemoralis* var., Box, Wantage (1910)——H. A. Saunders, M.A., Keble.

A tick from a tortoise and another from a dog——Miss Poulton.

ADDITIONS TO THE COLLECTIONS IN 1912.

Hitherto uncatalogued accessions in 1912 are, when presented by the same donor, followed by those of earlier years, as indicated by dates at the beginning of the paragraphs. When no such date appears 1912 is always to be understood. The additions are grouped geographically in the following order: Africa, Oriental Region, America (N. to S.), Europe, British.

Eight Lepidoptera, 4 Aculeate Hymenoptera and 1 Phasmid, from Port Lokkoh in the Karene district of Sierra Leone (about 70 ft,)——Mrs. M. Addison. The butterflies include *Acraea encedon*, form *alcippina*, the white-hind-winged variety especially developed in Sierra Leone in mimicry of the dominant W. African form of *Danaida chrysippus*.

1911.—Also by the same donor, seven butterflies, 140 moths, and 16 insects of other Orders from the Kennema Railway District (about 200 ft.) of Sierra Leone, together with 8 insects from Shengay, about sea level (1910-11). The butterflies include a female of *Aphnaeus orcas* and a male of *Epitola honorius*. The moths, a particularly interesting series, include a new Catocalid recently described by Sir George Hampson as *Homaea addisonae*.

An interesting series of 32 insects and other Arthropoda, from Faras (about 400 ft.), 25 miles N. of the Second Nile Cataract——Prof. F. Ll. Griffith, M.A., Queen's.

A very fine set of 371 moths with the species determined, 69 Coleoptera, 56 Rhynchota, 37 Neuroptera, 30 Orthoptera and 4 Diptera, White Nile localities (Jan.—Apr.)——G. B. Longstaff.

Forty-three insects of various groups, Port St. Johns, W. Pondoland, S. Africa——the late Herbert Druce, F.L.S. The butterflies include 5 *Acraea igola*. The locality renders the specimens of much value to the collection.

Three Danaine butterflies (*Amauris*) for the General Collection and 4 for the Mimicry Collection, from Bitja, Ja River, Cameroons (about 2000 ft.), captured Apr.—

Jun., 1910, were purchased from Messrs. W. F. H. Rosenberg. The latter set has been placed with the mimetic Danaine *Tirumala morgeni*, from the same locality. Also purchased from the same Firm 5 Papilios from Formosa.

A fine series of named Termites—54 mounted specimens—from various localities and at various dates in India and Ceylon——T. Bainbrigge Fletcher, Director of the Agricultural College, Coimbatore, Madras. The collection includes several species, and 7 co-types of *Eutermes lacustris*, Bugnion, from Ceylon.

The following valuable accessions were presented by H. H. Banks: 1912.—One Longicorn beetle taken on the ship off Perim.

1911, 1910.– One hundred and fifty-eight Hymenoptera in 1910, together with 65 Hymenoptera, 26 Coleoptera, and 3 Homoptera in 1911, principally from the Seremban District, Negri Sembelan State, Fed. Mal. States. Also from the same locality a Fossorial wasp allied to *Tachytes* with its prey, an Acheted, and another related species with a spider. Several of the 1910 captures were made in the Kinta District of Perak State.

Eighty-four insects of various groups, especially moths, from the Singapore Botanical Gardens (1905)——H. N. Ridley, M.A., Exeter, F.R.S.

Forty insects of various groups, chiefly Lepidoptera, from the Langkon Estate, Kudat, Marudu Bay, British N. Borneo (1911-12)——J. F. Hornsey, B.M., Wadham. The butterflies include a beautiful mimetic *Hypolimnas*, and the mimetic female and non-mimetic male of the Bornean form of *Papilio polytes* captured *in coitû* (Mch. 3, 1912).

Thirty-one butterflies from the forest near Port of Spain, Trinidad——Guy A. K. Marshall. The series includes an example of the Nymphaline *Protogonius* and its chief model in Trinidad, the Ithomiine *Tithorea megara*, taken on the same day, Feb. 4; also a Hesperid exhibiting injuries due to the attack of an enemy, probably a bird.

The following valuable series were presented by the late Herbert Druce, F.L.S.:—(1) Three hundred and fifteen moths (117 *Geometridae* and 198 small moths, mostly Pyrales) collected by Watkins, about 1906, at La Merced, Chanchamayo, Peru (1000 metres). (2) One hundred and thirty-three moths, chiefly *Noctuidae*, from Jalapa, S.E. Mexico (about 1898). 1910.—(3) Twenty Ithomiine butterflies from Venezuela.

One hundred and twenty Coleoptera, 9 Hemiptera and 3 Hymenoptera, Blankenberghe, Holland——H. St. J. K. Donisthorpe.

ADDITIONS TO THE BRITISH COLLECTIONS IN 1912.

One hundred and two moths, chiefly *Noctuidae*, from various localities, especially in the neighbourhood of Mortehoe, N. Devon (various dates since 1884)——Dr. F. A. Dixey, M.A., D.M., Wadham, F.R.S. The series includes 4 *Cucullia absinthii* bred in 1902 from larvae found by Dr. G. B. Longstaff, and 2 *Polia xanthomista*, including one of the two captured at Sugar (1890) and recorded in the *Entom. Monthly Mag.* (1893, p. 57) and in Barrett's "British Lepidoptera" (IV., 1897, p. 302). Specimens from Highgate Wood (1876) and other London localities are also included.

One hundred and six moths from many localities (1899—1911)——C. F. Johnson. The series includes many rare species such as 1 *Pachnobia alpina* and 4 *Asteroscopus nubeculosa* from Rannoch, 8 bred *Hadena glauca* from Rannoch and Staffordshire, 13 *Epione parallelaria* (*vespertaria*) from near York.

Four *Luperina gueneei*, captured by A. Murray at St. Anne's-on-Sea, Lancashire (1911)——B. H. Crabtree.

Two *Polia nigrocincta*, taken at Sugar, Gurnard's Head, Cornwall (1911), and 8 *Eupithecia jasioneata* bred (1912) from larvae found near Penzance——G. B. Kershaw.

An example of the Arctiid moth *Euchelia jacobaeae* seen to be captured while flying and then abandoned by a robin (Woking, June 20, 1912)——Roland Trimen, F.R.S. (Proc. Ent. Soc., 1912, p.p. xc., xci.)

Thirty-seven Coleoptera, Hampshire, Surrey——C. J. C. Pool. The series includes 3 *Philydrus quadripunctatus*, new to Britain, 1 *Hister purpurascens*, and 15 *Harpalus aeneus* shewing colour variations in a single colony.

Twenty Diptera from the New Forest (1902—1910, F. C. Adams. The series includes 9 beautifully-mounted Tipulids, and 5 examples of *Empis tessellata* with their Dipterous prey—a *Leptis*, a Tachinid and 3 Tipulids.

One *Carabus nitens*, Loch Lomond; 3 males and 2 females of the rare beetle *Hylecoetus dermestoides* from a log of Scotch pine, Ardlui, Loch Lomond ("Entom. Record," 1912, p. 191)——R. S. Bagnall. Two of the males are dark colour varieties.

One Red Admiral butterfly, *Pyrameis atalanta*, St. Helen's, Isle of Wight (Aug., 1903), evidently attacked while the wings were still soft——the Professor.

Six of the Geometrid moth *Thera variata*, Chandler's Ford——Major R. B. Robertson. This species was first recognised as British by the donor.

Four parasitic Diptera from birds and cattle——The British Museum of Natural History.

The following captures, except when otherwise stated, were effected in the Oxford district, and in the year 1912:—

Ten Lepidoptera, Oxford (1911, 1912)——A. H. Hamm; also for the bionomic collection a female *Lycaena argiolus* in spider's web, Oxford Univ. Museum; a *Cidaria truncata* (*russata*) with the hind margins of the wings on right side shorn cleanly off, Headington; a Hemipteron, *Pentatoma rufipes*, much injured, Magdalen Bridge; a male and female Burying beetle, *Necrophorus vespillo*, flying together, near Cowley. On the wing they were taken for Humblebees and Mr. Hamm considers it likely that the elytra are nearly closed during flight, exposing the pattern of the upper surface; a fly, *Limosina* sp., with an immense load of *Acari*.

Thirty-one insects of various groups——J. Collins, of the Hope Department. The series includes 6 of the rare Dolichopid fly *Scellus notatus*, 8 of the rare beetle *Orectochilus villosus* (Aug., 1910), 2 *Lathrobium pallidum*, 5 *Aphthena nigriceps*; also 1 *Empis tessellata* with Tipulid prey.

One *L. argiolus* (Oxford) and 1 Galerucid beetle (Malvern)——H. Trim.

One Locustid and 1 Culicid——Commander J. J. Walker.

One *Reduvius personatus* (Hemiptera), Marston——R. S. Bagnall.

One *Empis livida* with prey, Bagley Wood——Colbran J. Wainwright.

One Lime hawkmoth, *Smerinthus tiliae*——Mrs. Rawlings; also 1 Poplar hawkmoth (*S. populi*), Oxford (July) ——Brought to the Museum.

ADDITIONS TO THE COLLECTIONS IN 1913.

The arrangement adopted is the same as that explained under 1912.

A wonderfully interesting family of *Papilio dardanus*, bred from a *hippocoon* female form captured Nov. 19, 1913, at Moor Plantation, near Ibadan, S. Nigeria—— W. A. Lamborn, late Entomologist to the Agric. Dept. of S. Nigeria. The family consisted of 15 males, 9 *hippocoon* and 8 *dionysus* females, this being the first occasion on which these latter remarkable W.-coast forms have been bred. Thirty of the butterflies are accompanied by their respective pupa-cases. Many of the pupae had been exposed to artificial cold and some to a moist atmosphere, but there was no evidence of any effect produced upon the resulting butterflies. The mimetic *hippocoon* females were very constant in pattern, while their non-mimetic *dionysus* sisters were extremely variable. The family was exhibited to the Ent. Soc., June 3, 1914. See Proceedings, pp, lxiii.—lxx., where it is argued that the *hippocoon* form is a Mendelian recessive, *dionysus* a dominant, and that the female parent had paired with a male heterozygote. Such parentage should give half recessives and half heterozygotes, the latter having the appearance of the dominant *dionysus.*

The following specimens bred in 1912, 1911 and 1910 at Oni camp in the Lagos district of S. Nigeria and presented by W. A. Lamborn have been catalogued and incorporated since the appearance of the Reports for those years:—

1912.—Three families—D, E, F—bred from the eggs respectively laid by three captured *hippocoon* females of *Papilio dardanus.* The whole of .the female offspring were *hippocoon,* viz. 14 with 10 males in D, 7 with 2 males in E, 6 with 4 males in F. Many of the pupa-cases of D are also included. The pupae of this family were exposed to artificial cold, and at first it appeared that the rudimentary "tails" on the hind wing of some of the female offspring were probably thus caused. The 1913 experiments throw doubt upon this interpretation (see p. 33). An account of these three families has been published in Proc. Ent. Soc., 1912, pp. cxxxi.—cxxxiv.

Two male and 2 female *Hypolimnas* (*Euralia*) *anthedon*, examples of an all-*anthedon* family, and 5 male and 3 female *H.* (*E.*) *dubia* examples of an all-*dubia* family. Each family was reared from the eggs laid by a captured female of unknown form, unfortunately mislaid or more probably lost in the post.

1911.—A family of 37 butterflies reared from the eggs laid by a single female of the Danaine butterfly *Amauris psyttalea* which unfortunately escaped. The offspring exhibit the most complete transition between the two "species"—*psyttalea* and *bulbifera* (Proc. Ent. Soc., 1912, pp. lxxvii., lxxviii.). Thirty-five pupal cases and many larval skins are also included.

A second family of 18 *A. psyttalea* reared from a company of larvae, the product of a single batch of eggs, found in Oni clearing. Seven pupal cases are included. This family also shows transition to *bulbifera* (Proc. Ent. Soc., *ibid*).

A family of 14 *Danaida chrysippus*, form *alcippus*, together with the female parent of the same form, captured in Oni clearing. Many pupal cases and larval skins are included. In addition, 2 *alcippus* and 2 *Amauris niavius* (with their pupa-cases) bred from larvae found singly. Although *D. chrysippus* is such an abundant and wide-ranging species, this is, it is believed, the first time that the butterflies have been reared from the eggs laid by a known female.

1910.—A family of 29 *Salamis cacta* bred from a company of small larvae found on the top of a single leaf in the forest 2 miles E. of Oni. Also 28 pupa-cases, of which 19 accompanied their respective butterflies, and many larval skins of different ages. The butterflies are "set" to show the great range of variation of the under surface and the different patterns into which the individuals are grouped (Proc. Ent. Soc., 1912, pp. lxxv., lxxvi.).

The following fine collection of insects, chiefly Lepidoptera (1910-13), presented by J. A. de Gaye, have now been incorporated:—

(1) Fifty-four butterflies, 191 moths, 130 insects of other groups, King's College grounds, Lagos. The butterflies include the female type of *Epamera degayei*, H. H. Druce, *Myrina subornata* and many other species of much value to the collection. Among the moths is an interesting series of *Sphingidae* captured at lilies, 6.30 p.m., June 17—24:—23 *Nephele peneus peneus*, 8 *N. peneus innotata*, 1 *N. accentifera*.

(2) Eighty-two butterflies, 31 moths, 79 Coleoptera, 54 insects of other groups and 3 *Acari*, Ikoyi Plain, Lagos.

The butterflies are a most valuable and interesting set, including the male type of *Epamera degayci*, *Pyrrhochalcia iphis* and its Agaristid mimic *Messaga monteironis*, shewn at the Ent. Soc., Nov. 6, 1912 (Proc., p. cix.). The Hymenoptera include parasites bred from *Acraea zetes*.

(3) Fifty-five butterflies, 22 moths, and 3 other insects, Ebute Metta Botanical Garden, Lagos. The butterflies include a pair of *Euxanthe eurinome*, *Planema vestalis*, *Ploetzia cerymica*, *&c.*

(4) Nineteen moths, at light, Iju, 13 miles from Lagos.

(5) A fine bred series of 11 females and 1 male of the Lasiocampid moth *Taragama vesta* with 11 cocoons, Lagos. The male is quite unlike the female and was only recognised as belonging to the same species after both sexes had been bred by Mr. de Gaye and Dr. G. D. H. Carpenter.

The female parent, of the *planemoides* female form of *Papilio dardanus*, with its 12 male, 3 *planemoides* and 7 *hippocoon* female offspring bred, Bugalla I., Sesse Archipelago, N.W. Victoria Nyanza——G. D. H. Carpenter, D.M., Non-Coll. The first and only time that the *planemoides* form has been bred or bred from. This most interesting family is described in Proc. Ent. Soc., 1913, pp. xxxiii.—xxxv., liii.—lvi., and figured in Trans., 1913, Plate xxxix.

A very interesting series of 224 butterflies and 1 moth, Nuba Hills, between El Obeid and Lake No, Anglo-Egyptian Sudan (1904-06), captured by R. S. Wilson ——C. A. Willis, B.A., Magdalen. It is hoped that an account of the collection will soon be published. The tropical forms from further south which extend into the forested Nuba Hills are of great interest. Among the species is the rare *Acraea sykesi* and many *Lycaenidae* and *Hesperidae* greatly wanted by the University Collection. Indeed the locality confers great value upon the whole. The data are admirably detailed and precise.

A female of the very rare Danaine *Tirumala morgeni*, from the Cameroons (1909), and a beautiful variety of the female *Papilio dardanus* from Entebbe (1906)——H. Eltringham. Both are new to the collection and a valuable addition to it.

Twenty-seven butterflies (including 4 *Planema poggei*, 1 *T. mercedonia* and a series of varieties of *D. chrysippus* with the form *albinus*), and the Arctiid moth *Rhodogastria leucoptera*, from many localities between Entebbe and Hoima, the capital of Unyoro (1910)——C. A. Wiggins, D.P.M.O. of the Uganda Protectorate, who has done so much for the University Collections, rendering them pre-eminent in insects from Uganda.

Seventy-one butterflies and 2 moths from about 1° S., and 35° E., British East Africa (5-6000 ft.)——H. B. Popplewell, B.A., Lincoln. The butterflies include 4 males and 1 female *Tirumala formosa*, and some interesting Lycaenids.

The following valuable series were presented by the Entomological Research Committee of the Colonial Office:—

1913.—(1) Thirty-seven insects of various orders captured in British East Africa by S. L. Hinde. The series is of all the greater value because the species had been determined in the British Museum (N.H.).

(2) One hundred and ninety-one named, blood-sucking, Ethiopian Diptera, including 61 *Glossina* (tsetse flies) of 5 species—*palpalis*, *morsitans*, *tachinoides*, *fusca*, *pallidipes*, 51 specimens belonging to various species of *Tabanus*, 10 of *Chrysops*, 44 of *Haematopota*, 8 of *Stomoxys*, 6 of *Hippobosca* and 11 of *Culex*.

1912.—(3) Twenty-five male *Planema macarista* collected by S. A. Neave in various localities in Uganda (1911-12).

1911.—(4) A valuable set of 78 Acraeas, collected by S. A. Neave in the Kenia district of British East Africa and near Mt. Elgon in N.E. Uganda. The species are 11 *Acraea uvui* (several forms with dark under surface; 2 pairs *in coitû*), 1 *doubledayi sykesi*, 2 *astrigera* (1 female form *brunnea*), 13 *conjuncta* (three of the female forms—*mutata*, *pica*, and *lutealba* new to collection), 8 *anacreon anacreontica* (new to collection), 36 *johnstoni* (a fine set of female forms), 3 *disjuncta*, 3 *melanoxantha* (new to collection), 2 *caecilia* (*in coitû*).

Eleven *Acraeinae* from Bulawayo (1913) and the Victoria Falls (1912)——G. Arnold, M.Sc., A.R.C.S., Curator of the Bulawayo Museum. The series is a welcome addition to the very fine collection of African *Acraeinae*.

Two examples of *Anaphe panda* bred 1911 at Mt. Chirinda, S.E. Rhodesia——C. F. M. Swynnerton. These moths are the first-fruits of a splendid collection which will be labelled and incorporated in the near future.

The following very interesting specimens were presented by E. A. Elliot:—

1913.—(1) Three male examples of *Danaida chrysippus f. alcippus* captured by Fairfax Prevost in Palma, Canary Isles (1903). The occurrence of this, the chief West African form, in Palma is extremely interesting; inasmuch as the type form of the species exists in Tenerife.

1912.—(2) Seven male *Papilio dardanus* captured about 1903-4 in the Nairobi district of Brit. East Africa by the late C. F. Elliott. The series exhibits a wide range of variation and includes some interesting forms with pale spots in the black margin of the fore wing.

A valuable collection of 234 Diptera, chiefly *Bombyliidae*, from the neighbourhood of Aden (Feb.—Apr., 1895)——Col. J. W. Yerbury. The localities—Lahej, Haithalhim, Shaik Othman, and Huswah, in addition to Aden itself, are always recorded, together with the precise dates of capture. The great majority of the species have been determined by the generous donor, who has now added this important series to the *Asilidae* and the *Syrphidae* from the same localities. In addition to the above, 8 Diptera from various European localities (1898, &c.) were presented by Col. Yerbury. They include examples from the Mendel Pass, Tyrol, captured by F. C. Lemann.

Fourteen Rhynchota, of 11 species named by Dr. G. Horvath, together with 8 Diptera of 6 species named by E. Brunetti, F. H. Edwards and Miss S. L. M. Summers, from Palestine (1912)——N. Annandale, D.Sc., M.A., Balliol, Director of the Indian Museum, Calcutta.

Two males and two females of the rare and beautiful Sphingid moth *Marumba nympha*, bred at Karwar, N. Kanara (1909) by T. R. Bell——the British Museum (N.H.).

A male *Appias libythea*, *in cop.* with a female *Teracolus limbatus*, captured by A. P. Green, Apr., 1887, at Aripu, on the coast of the dry N. Province of Ceylon——E. Ernest Green. Such abnormal unions between species of very different genera are extremely rare, and it is of much importance that the material should be preserved and available for study. The two specimens, still united, were exhibited at the Ent. Soc. (Proc., 1913, pp. cv., cvi.).

A valuable set of 137 insects of various orders and 5 other Arthropods from the neighbourhood of Kuantan, Pahang, Federated Malay States——Vernon G. Bell.

Thirty-one Asilid flies from How-lik Monastery, near Hongkong (1907)——J. C. Kershaw. This interesting addition to the collection of *Asilidae* includes 2 species of *Dasypogoninae*, both *Microstylum*, and 4 of *Asilinae*.

Six males of the fine Pierine butterfly *Delias eumolpe*, hitherto unrepresented in the collection, from the W. spur of Mt. Kinabalu (3300 ft.), British North Borneo ——J. C. Moulton, B.Sc,, Magdalen, Curator of the Sarawak Museum, Kuching.

1912.—By the same donor, thirteen butterflies from Sarawak (1910), much wanted by the Department.

A pair of *Ornithoptera alexandrae*, probably the most magnificent butterfly in the world——the Hon. N. Charles Rothschild. The specimens were bred from larvae found in the Owen Stanley Range in South-east New Guinea. The species is new to the collection and an extremely fine accession.

Eighty-three Lepidoptera taken within 7 miles of Healesville, on the wooded foothills (300—1800 ft.) of the dividing range of Victoria, Australia——Dr. A. Eland Shaw. The series of *Satyrinae* among the butterflies and of *Hepialidae* ("Swifts") among the moths are especially fine accessions to the collection.

Forty-two beetles and 1 Fossorial wasp from woods near Vernon, Canada, B. C. (1911-12), the beetles including a few examples from Manitou, Manitoba plains ——A. W. Sharp. The species have been kindly identified by W. E. Sharp, father of the donor.

Three moths, East End, S. Saskatchewan——G. S. Thornewill.

A collection of 150 insects from Phoenix (1100 ft.) and Prescott (6000 ft.), Arizona (1908-12) —— Dr. R. E. Kunzé, who has done so much for the Hope Department in previous years. The butterflies include a long series of *Danaida strigosa* and its Nymphaline mimic *Limenitis obsoleta* (*hultsti*), and of the rare Pierine *Anthocharis pima.* Among the other groups the Orthoptera were represented by a valuable set of 65 specimens, chiefly *Locustidae.*

In addition to the above, the following valuable accessions were presented by the same generous donor:—California (1912-13), collected by H. Kusche and J. B. Cottle, 8 butterflies, including 6 *Adelpha californica,* 15 moths (one fine Saturnid) and 2 beetles; Montana, Helena (1907), collected by W. M. Mann, 4 Lepidoptera including a fine *Melitaea* and Catocalid moth; New York State, W. Catskill Mts., Jefferson, collected by Miss Anna McNamee, 10 butterflies, including the rare form *proserpina* of *Limenitis astyanax;* Catskill Mts. (1909-10), 35 butterflies; California, chiefly Oakland (1908), collected by G. R. Pilate, 74 butterflies; Colorado, 27 Coleoptera; Greaterville, Arizona, 13 Coleoptera; Texas, 13 Coleoptera.

A fine series of Lepidoptera from the following Neotropical localities——W. Schaus, who has so generously helped the University Collections on many previous occasions:—

(1) Mexico (many localities, 1906)—32 Lepidoptera.

(2) Costa Rica (many localities, 1907-9)—a fine set of 86 butterflies, including a beautiful mimetic *Papilio*, and 30 moths, including 12 very fine *Sphingidae*.

(3) Panama, Bejuco River (1909)—3 *Ithomiinae*.

(4) Surinam River, Geldersland (1904)—4 *Ithomiinae*; French Guiana—6 *Ithomiinae* and *Danainae*, shewing with the Surinam specimens the blackened hind wing characteristic of the most important synaposematic association in the Guianas.

(5) Cuba—8 Lepidoptera.

A butterfly, *Catagramma*, from British Honduras (1910) ——H. Bilborough.

A very fine collection of 739 butterflies and 6 moths from Trinidad——Rev. K. St. Aubyn Rogers, M.A., Wadham. The specimens are all the more valuable because of the number of localities represented, some of them being on the South coast and in the southern mountain range, others in the central range. Altogether 14 different forms of locality label were printed. The butterflies include representatives of nearly every group, and among the moths are 2 Castniids and a Uranid. A synaposematic series of 2 *Ithomiinae*, 1 *Lycorea*, and 1 *Eueides* captured together in the forest, Emperor's Valley, Port of Spain, on Feb. 3, have been added to the bionomic series. The collection has been studied by W. J. Kaye, the principal authority on the butterflies of the island, who has found in it and has described 1 new Erycinid, *Mesene simpla*, and 5 new Hesperids, *Myscelus rogersi*, *Euroto simplissima*, *E. cocoa*, *Cobalopsis musa*, and *C. rogersi*. The collection also contained 2 Nymphalines, 1 Erycinid, 2 *Lycaenids*, and 9 Hesperids hitherto unrecorded from Trinidad. (Trans. Ent. Soc., 1913, p. 545.)

Forty-seven Lepidoptera and 82 insects of various orders and other Arthropoda collected in 1896 by J.

Quelch on the Corentyne River, forming the boundary between British and Dutch Guiana——Richard Evans, D.M., D.Sc., Jesus. The locality renders the insects of much interest. These specimens which were presented to the Department several years ago, had been overlooked, and having been recovered and labelled in 1913 are added to the catalogue of that year.

Seventy-two butterflies, 10 moths and 5 dragonflies from the neighbourhood of S. Paulo, S.E. Brazil——Miss Diana R. Wilson (Mrs. Fyson). The butterflies include *Penetes pamphanis*, a fine and rare species of *Brassolinae*, described by Professor Westwood, but hitherto unrepresented in the University Collection; also 3 examples of a beautiful little Erycinid, apparently the same as a hitherto unnamed local form collected by W. J. Burchell at S. Paulo about 1827. The mimicry collection is also enriched by examples of models belonging to the *Pharmacophagus* section of the Papilios, viz., *Papilio chamissonia*, and mimics belonging to the *Cosmodesmus* section of the same sub-family—*P. lysithous*: also for the same series, the *Pharmacophagus* model *P. polydamas*, and its mimic *P. scamander grayi*, belonging to the *Papilio* section of the group. These interesting examples were not only taken in the same locality, but sometimes flying together on the same day. Although the mimetic resemblances illustrated in this collection are well known, the habits of the species have never before been described. See Proc. Ent. Soc., 1913, pp. cxix.—cxxii., where Miss Wilson records these and many other interesting observations.

Fourteen Lepidoptera from Estancia do Rey, Banda Oriental, Uruguay (1905)——Mrs. E. S. Craig.

Twenty-five butterflies from Concepcion (about 3300 ft.), Prov. Tucuman, N.W. Argentine——C. M. Dammers, who has previously assisted the University collections with specimens from this most interesting locality. Four examples of the rare *Tatochila immaculata* (*Pierinae*) are included (Proc. Ent. Soc., 1913, p. xliii.); but the whole series is most welcome.

M. Charles Oberthür of Rennes again generously presented the University Collections with the following fine series of butterflies from localities some of which are better represented in his magnificent collection than in any other in the world:—

(1) W. China, Szu-chuan, about 30° N., 102·5° E., Ta-tsien-lu, and Siao-lou and Tien-tsuen near it (1897—1910): also W. Szu-chuan, Traku and Venchuan (1891)—120 butterflies, a splendid series especially of *Nymphalinae*, and 8 moths. Also from the E. frontier of Tibet (1905) and Tchang Kou (1892), 6 butterflies, including 2 *Armandia thaidina*.

(2) S.W. China, N. Yunnan, about 26·5° N., 101° E., Tse-kou, on R. Yang-tse-kiang (1902-9)—16 butterflies.

(3) E. Java, an example of *Acraea vesta*.

(4) Madagascar and the Comoro Islands (1885-96)—16 Acraeas, including a series of 9 *A. encedon* which has been of great assistance in the preparation of a paper in Journ. Linn. Soc. Zool., vol. xxxii., 1914, p. 391. Also a beautiful example of the extraordinary *Hypolimnas dexithea*, of which the University collection contained only 2 imperfect specimens very cleverly repaired by Professor Westwood.

(5) Congo State (various localities, 1900-4) and Cameroons (1896-8)—19 *Acraeinae*.

The following valuable accessions to the collections of Lepidoptera were presented by J. J. Joicey, Hertford:—

(1) Central Madagascar, 2500 ft. (1911), collected by F. B. Pratt—33 butterflies and 42 moths, a very interesting series much needed by the Department.

(2) New Guinea (1902—1910), collected by A. E., C. B., and F. B. Pratt, a fine series of 141 butterflies and 106 moths from various localities, including Dorei Bay; Wendisi, Amberfron and Mioswar Islands in Geelvink Bay; Hatam (3000 ft.), Momi (4500) and Warmasin (6000) in

the Arfak Mtns.; Fak Fak, Sourabaya, Jobi I (Wooi Bay), River Uty in Dutch N. Guinea; Dinawa (4000), Ekeikei (1500) in British N. Guinea. A few specimens from the Aru Islands are also included. Until quite recently this extremely rich and interesting island of New Guinea has been almost unrepresented in the University collections. Now, however, owing to this and earlier gifts by the same and other generous donors, the gap is being filled in a very satisfactory manner. The fine series from British N. Guinea presented by G. N. Carson, and from Bwaidogo, Goodenough I. (D'Entrecasteaux group) by D. Jenness, B.A., Balliol, shortly to be labelled and catalogued, will be a further important addition to this most interesting Lepidopterous fauna.

(3) Andes of N. Peru (1912), collected by A. E. and F. B. Pratt—a fine series of 276 butterflies and 118 moths from many localities, principally on the E. slope, and varying in elevation from 1000 to 7000 ft. This extremely rich Lepidopterous fauna is also poorly represented in the University Collection, and the donation is correspondingly valuable. The data accompanying all these specimens from Madagascar, New Guinea and Peru are admirably detailed, and add immensely to the value of the specimens.

The following series of butterflies, &c., presented by G. B. Longstaff:—

(1) Dominica—80, of many groups, mostly from the Rosean Valley, some of them from Canefield in the latter locality, captured by C. Ingram.

(2) St. Lucia, Castries and the neighbourhood—34.

(3) Barbados (1912)—16, of which one was taken at sea 140 miles N.E. of the island and 10 on the island itself, by Rev. K. St. Aubyn Rogers.

(4) St. Vincent Harbour, at the ship's lights—2 moths and 2 beetles.

(5) Grenada—11 butterflies, of which one was taken at sea S. of the island.

(6) Trinidad, Emperor's Vale, Port of Spain—110 of nearly all groups, including 4 taken by Rev. St. Aubyn Rogers.

(7) Venezuela, neighbourhood of La Guaira—195, of nearly all groups. These West Indian and South American specimens, accompanied by admirable data, are a very valuable accession.

(8) A valuable series of 226 butterflies and 194 insects of other orders, principally Coleoptera, from Southern Spain (Jan.—Apr.). The localities are Gibraltar, Ronda, Granada, Sevilla, Cordova, and Algeciras or in the neighbourhood of these places. The butterflies include 17 *Thais rumina* (one being the var. *canteneri*), a good series of *Synchloe tagis* from Ronda, its special locality. Dr. Longstaff found that the scent differed from that of an allied species, *S. bellidice*, captured with it, and observed that *T. rumina* has the characteristics of a protected species (Proc. Ent. Soc., 1913, pp. lxxxvii.—lxxxviii.).

(9) Two examples of *Pyrameis indica*, form *vulcania*, 1 moth and 4 Coleoptera from Las Palmas, Grand Canary.

Six ants, Jaca, N. Spain——E. R. Speyer.

The following valuable additions to the collection have been presented by Commander J. J. Walker:—

(1) A male and female of the Lasiocampid moth *Megasoma repandum*, from Gibraltar (1888), (Trans. Ent. Soc., 1890, p. 382).

(2) 219 butterflies and 18 moths collected by C. T. Bowring in the Wenchow district of S.E. China (1912). These Chinese Lepidoptera, from a district hitherto unrepresented are of the greatest value to the Department. The moths include a beautiful mimetic Uranid.

(3) A pair of the very fine butterfly *Euploea jessica*, from the New Hebrides (1900), the male captured by the donor in Palao Bay, Efate I., the female by T. Truss in Malekula I. The species was previously unrepresented in the University Collections.

(4) A valuable series of 9 examples of the Pierine

genus *Tatochila* from many S. American localities. The specimens, which were all captured (at various dates) by the donor and are accompanied by admirable data, are an important addition to the very fine collection of Pierine butterflies in the Department.

1902.—(5) An interesting mimetic combination of 11 insects from the Sydney district of New South Wales. The central model is the common Australian Lycid beetle *Porrostoma rufipennis* (4 examples), the mimics being 2 or 3 species of *Mylabridae* (3 ex.), 1 Longicorn and the weevil *Rhinotia haemoptera* (3 ex.).

The following specimens, forming the material of interesting communications to the Ent. Soc. (Proc. 1913, pp. xxxii.—xxxiii., xlix.—liii.), were presented by the captor Dr. Adalbert Seitz of Darmstadt:—from Batna, Algeria—the Asilid fly *Heliogmoneura brunnipes* and an example of the Oncodid (Cyrtid) fly *Physegaster maculatus*, a species Dr. Seitz records as the victim of the Asilid; from S.E. Brazil, on the road, passing through high forest, between Santos and S. Vicente (about 1888)—the Fossorial wasp *Pepsis sapphirus* with its mimics the Hemipteron *Spiniger ater* and the Locustid *Scaphura nigra*, var. *vigorsii*, exceedingly beautiful examples of mimicry fully described in the above communication, [the group being completed by an example of *Macrocneme lades*, from Castro, Parana (1910)——W. J. Kaye]; from Hong-Kong, Singapore and Ceylon—examples of the mimetic female forms or non-mimetic male-like forms of *Papilio polytes* characteristic of these localities.

Twenty-three butterflies and 35 moths, various localities in S. England——F. C. Woodforde, B.A., Exeter. For the general collection of Lepidoptera.

ADDITIONS TO THE BRITISH COLLECTIONS IN 1913.

The following valuable accessions, especially of Coleoptera, have been presented by H. St. J. K. Donisthorpe, the captor of nearly all the insects, who has done so much for the British Collections during so many years:—

(1) Sixty-four beetles and 4 Hemiptera from Lundy Island. The beetles include *Melanophthalmus distinguendus* peculiar to the island, and the whole collection is of much interest because of the locality.

(2) One hundred Coleoptera from various localities in Surrey, Middlesex, Cornwall, Inverness, Co. Kerry, &c. (1912-13) including several rare and interesting northern forms and 5 species not previously given by the generous donor; also from several localities, 22 insects of various Orders, including 1 male and 3 wingless females of the Geometrid moth *Nyssia zonaria* from Tiree island—a new record; 2 Ectoparasites—*Trichodectes latus* and *Haematopinus piliferus*—from a Pekinese spaniel; and 2 Mallophaga (*Menopon* sp.) on Plover's eggs, Tiree (1912); for the bionomic series, a spider (*Philodromus*) with its prey the beetle *Grypidius equiseti* from Luccombe Chine, Isle of Wight (1909); and, for the series illustrating distribution, 3 accidentally introduced beetles from Kew Gardens (1911).

(3) An interesting collection of 59 beetles from S. Wales, chiefly from the Tenby district. The species include 1 *Hister neglectus*, 6 *Pachylopus maritimus*, 2 *Kissiter minima*, and 1 *Cassida sanguinolenta.*

1912.—(4) One hundred and thirty-three beetles (including a number of rare northern species, e.g., *Criocephalus rusticus* and the black form of *Carabus arvensis*) a few taken in 1910; also 30 insects of various Orders, including a series of 5 Empid flies with their prey. The insects were collected in many localities in several of the Scottish counties and the Isle of Eigg, in S. Wales, Cheshire, Norfolk, Kent, Sussex, Surrey, and S. Devon.

1911.—(5) Two hundred and forty-one Coleoptera, 8 Hemiptera, and 1 Homopteron from Aberdeenshire, Co. Meath, and a number of Southern English Counties (1900-10). The beetles include 74 species additional to those previously given by the donor, with such interesting forms as the Northern *Elaphrus lapponicus* (including black var.) and *Anchomenus ericeti.*

(6) Six Empid flies, *Tachista* sp., from Tubney, near Oxford.

1907.—(7) Forty-four insects, chiefly Aculeate Hymenoptera, from Deal.

The following valuable additions to the British collections are due to the generosity of F. C. Woodforde:—

(1) New Forest and neighbourhood, many localities—111 butterflies, 344 moths, including 7 bred *Notodonta trepida*, 1 *N. chaonia*, 9 *Zygaena meliloti*, 4 *Sesia asiliformis*, and 1 *Phalera bucephala* with R. hind wing malformed; 29 Parasitic Diptera, viz. 11 Tachinids, bred from *Asphalia ridens* and 1 from *Bombyx rubi*, 17 of the huge *Echinomyia grossa*, bred from *B. rubi*. Pupa-cases both Dipterous and Lepidopterous are included. Nine *Tabanidae* and 1 *Hippobosca*. Three Phorid flies bred from larvae seen by A. H. Hamm emerging from the body of *Z. meliloti* which had been killed about July 12 with ammonia, so that eggs had probably been laid by the parent fly in the body of the dead moth at some later date. Seven insects of other orders.

(2) Freshwater, Isle of Wight—2 butterflies, a fine series of 120 Noctuid moths.

(3) N. Devon—28 butterflies, including 6 *Leucophasia sinapis* and 2 *Thecla betulae*, 9 moths; also a butterfly *Pararge egeria* and a moth *Arctia villica* with injuries to both hind wings almost certainly caused by birds; 3 Ichneumonids, with their cocoons, from a pupa, probably of the moth *Gortyna flavago*, found in a thistle-stem.

(4) Eight *Endromis versicolor* bred Mch.—Apr., 1913, in the New Forest, from parents bred in 1912 from a S. English male and Scotch female (1911). Also ova from the 1912 female parent, and 2 pupae (Aug. 1912) of her offspring.

(5) Cocoons of the following moths:—3 of *B. rubi* (May, 1913) from New Forest larvae (Oct. 1912); 1 of *N. trepida*; 1 of *Bombyx castrensis* (Aug. 1913) from larvae collected in Sheppey Isle by Commander J. J. Walker.

The British Lepidoptera have been greatly enriched by 255 butterflies and 465 moths, including a few pupae and cocoons, from the Tiverton district and also from many localities in Cornwall, Warwickshire, Northamptonshire, Huntingdonshire, Herefordshire, Isle of Wight, Sussex, Cambridgeshire, and Kent——B. G. Adams. The specimens, of which the great majority were captured 1911-13, include fine series of the following butterflies—*Vanessa c-album*, *Melitaea cinxia*, *M. athalia*, *Lycaena arion*, *Thecla betulae* (bred), *Carterocephalus palaemon*, and of the following moths—*Macroglossa bombyliformis*, *Aplecta advena*, *Hydrelia uncula*, *Phorodesma pustulata* (*bajularia*), *Lobophora viretata* (bred), *Epione apiciaria*, *Yponomeuta cognatellus* (bred).

Three dark forms of *Agriopis aprilina*, bred Oct., 1911, by F. Littlewood at Kendal, Westmoreland——T. A. Chapman, M.D. Also a preparation shewing the remarkable anterior leg of this species, and a Syrphid fly, Reigate (1910).

A female *Sirex gigas* captured at Hambleden, Henley-on-Thames, 1913, by Florence Furness——T. D. Acland, D.M., Ch. Ch.

Ten of the minute beetles *Cis pygmaeus*, from fungus, Sandown, I. of W.——C. J. C. Pool.

A male *Gonepteryx rhamni* shewing excessive wear after hybernation, Crowborough, Sussex——E. R. Speyer.

Two cockroaches *Leucophaea surinamensis*, in old greenhouses, Bradford (1912)——F. Rhodes.

The Noctuid moth *Bryophila glandifera*, 23 from walls of various colours, Paignton (1912-13)——R. C. L. Perkins, D.Sc., M.A., Jesus. The moths shew great variation, but there was no evidence of the selection of specially suitable surfaces.

The following insects, unless otherwise stated, were captured in the Oxford district, and in the year 1913:—

Presented by Commander J. J. Walker:—(1) A Syntomid moth *Ceramidia* sp. near *chloroplegia* found alive in a fruit-shop at Summertown near Oxford. It is probable that the cocoon had been imported in bananas from Jamaica, see Proc. Ent. Soc., 1913, p. lxx.; (2) 1 *Sirex gigas*, Market Street; 1 Locustid, *Platycleis brachyptera*, Woking; a male and female of the very local moth *Clisiocampa castrensis*, bred at Harwich by F. Kerry (1879); 1911.—(3) 6 insects from various localities including 2 Cyrtid flies from Cothill, nr. Abingdon.

The Noctuid moth *Hydroecia petasitis*, in spider's web, wall of Wadham College, Warden's Garden (Sept. 11, 1900)——A. H. Hamm. The first record of this species in the Oxford district: a second example has since been taken.

The following additions to the bionomic series——A. H. Hamm:—the Diptera *Volucella bombylans*, v. *mystacea* from a spider's web, and *Empis tessellata* attacked by a sparrow; *Vespa germanica* with its prey a male *Bombus* sp., probably *terrestris*; the bees *Bombus lapidarius* and *Anthophora pilipes* injured evidently by birds.

The following beetles and moths including rare and interesting species——Joseph Collins, of the Hope Department:—2 *Haemonia appendiculata*, from the Cherwell at Gosford, 4 *Nemasoma elongatum*, Water Eaton; also 2 Proctotrupids from the runs of *Hylesinus vittatus*, Water Eaton, evidently parasitic upon it or its parasite, the before-mentioned *Nemasoma*; the moths, 1 *Panolis piniperda* and 2 *Cucullia verbasci* bred from larvae, Tubney (1912).

A pair of *Bombus lapidarius*, in cop., and 3 *Oxypterum pallidum*, a Dipterous parasite, from young Swift, Museum grounds; 1 Hemipteron and 1 Staphylinid beetle, Park Town; 1 *Corymbites cupreus* v. *aeruginosus* and 2 *Geotrupes sylvaticus*, Cheviots——R. S. Bagnall.

Twenty-four moths, including a series of *Anchocelis pistacina* and *A. lunosa* and 1 *Phigalia pedaria*, from Shrewsbury and Oxford——W. J. von Monté Pendlebury, Keble.

For the bionomic series:—*Vespa vulgaris* with Dipterous prey, Aberdeenshire; *Empis tessellata* with moth prey, and the Dipterous prey, *Leptis scolopacea* of another *E. tessellata* (lost), Tubney, near Oxford——E. A. Cockayne, M.A., D.M., Balliol.

One Odonate and a Tipulid, near Abingdon——Rev. C. F. Thornewell.

The White Plume moth, *Aciptila pentadactylus*, Tackley Place——W. Stone.

The Geometrid moth, *Amphidasys betularia*, Park Town ——the Professor.

Sirex gigas, Lonsdale Rd., Oxford——Mrs. Pogmore.

A Queen *Vespa germanica*, Univ. Observatory (Apr. 3) ——Professor H. H. Turner, D.Sc., M.A., New College, F.R.S.

Plusia moneta, at light, Museum Rd.——H. Eltringham.

The green cockroach *Panchlora viridis*, in bunch of bananas, Henry Rd.——A. Gillam.

The Longicorn beetle *Clytus arietis*, on Acacia bark, Bevington Rd.——P. Bartholomew.

A large Lycosid spider, an accidental importation, found alive by a boy—purchased for the Department.

ADDITIONS TO THE COLLECTIONS IN 1914.

The accessions are arranged geographically as in 1912 and 1913.

A fine collection of 733 butterflies, South Africa—— G. B. Longstaff. The *Satyrinae* (189) and *Lycaenidae* (268) were especially rich, the former including a new form, *Pseudonympha detecta*, described by Roland Trimen, F.R.S., in Ent. Monthly Mag., 1914, p. 281. The specimens were captured in many localities near Cape Town, Caledon, Knysna, George, and East London, and the dates range from Jan. 7 to Apr. 9.

Thirty-five butterflies and 5 moths (*Urania*) from Ambatoharanana and the adjacent Ambohimanga, Imerina, Central Madagascar —— Rev. J. U. Yonge, M.A., Keble. This little collection, which is very welcome, includes a pair of each of the following species captured *in cop.*:—*Papilio epiphorbas, Strabaena tamatave, Belenois antsianaka.* Of the last-named species several specimens are present, together with a female of the rare *Ptychopteris lucasii*, 2 *Belenois helcida*, 1 *Precis eurodoce*, 2 *P. epiclelia*, 1 *P. andremiaja* (dry season form). The Uranias were part of a set of 7, of which 5 were females, captured together Jan. 8.

Fifty-two specimens, part of a family raised from the eggs of a typical female of *Acraea encedon*, Durban, Natal ——E. E. Platt. Thirty-two of the specimens were of the *encedon* form and 20 of that yellowish form of *lycia* known as *sganzini*. Males predominated over the females as they did in W. A. Lamborn's Lagos families in which both sexes were represented, thus rendering it probable that all-female-producing strains of female exist in S.E. Africa as they had been proved to exist in the W. Although the offspring segregated completely into the two above-mentioned forms the individuals of both sets exhibited distinct variation in the presence or absence and degree of development of a spot in area 2 of the fore wing. The specimens were exhibited at the Ent. Soc., Mch. 17, 1914. Further interesting butterflies bred in the Durban district by the same kind donor are:—7 *Amauris albimaculata* from a single batch of eggs, 13 *A. ochlea* together with their female parent, 2 *Antanartia schaencia*, 5 *Myrina dermaptera.* All are welcome additions to the University collection.

Two examples of the hawkmoth *Deilephila livornica*, at electric light on H.M.S. *Diadem*, Suez Canal, near Ismailia (Feb., 1903)——J. J. Walker.

Six Syntomid moths of two species, bred 1907-8 in the Durban district by Miss M. E. Fountaine——H. Rowland-Brown, M.A., University.

An example, unfortunately in poor condition, of the mimetic *Acraea althoffi pseudepaea*, Odumassi, 35 miles S. of Kumassi (1904-5)——H. Eltringham. This rare subspecies, new to the collection, is of great interest, inasmuch as the species assumes a different pattern in Uganda in mimicry of other Planemas.

Two examples of the rare mimetic African Lycaenid butterfly *Mimacraea marshalli* and a male and female of the rare Jamaican *Papilio homerus* were also presented by the same kind donor, together with the following rare moths :—1 *Cocyta durvillei* (Gilolo), 1 *Miliona sarawakensis*, 2 *Eudemonia brachyura* (Sierra Leone), 1 *Urania croesus*, 2 *Oenetus rubroviridans* (Queensland).

An Asilid fly, *Promachus* sp. and its prey, the male of *Delias descombesi*, Takdah, Sikkim, 5000 ft. (Aug. 18)——T. D. Broughton. The great relative size of the prey is of interest. The specimens were exhibited at the Ent. Soc., Mch. 17, 1914.

An interesting set of over 300 insects and 5 Arachnids from Java (1871-88) were presented by Miss Balfour. The specimens, probably of native capture in the neighbourhood of Batavia, formed the collection of the late C. Balfour. They include nearly 200 butterflies, 94 Coleoptera, and relatively small numbers of several other groups. Two mimetic associations from among the butterflies have been added to the bionomic collections —the dark forms of *Danaida* which are characteristic of Java and their models, and a female of the Javan form of *Papilio polytes* with its *Pharmacophagus* model. The beetles include 9 examples of the extraordinary form *Mormolyce*.

An interesting Geometrid moth with a conspicuous red and black pattern on the under surface of the wings, from British N. Borneo (July, 1892)——J. J. Walker.

One hundred and thirteen separate Coleoptera or mounts with two or more specimens, Celebes (1895-6) ——Charles Hose.

Over 100 insects of various groups, the neighbourhood of Healesville, Victoria (1913-14)——Dr. A. Eland Shaw. The series includes 25 pupa-cases of the Pierine butterfly *Delias harpalyce* attached to the web spun by the larvae over the food plant, *Loranthus*, together with 10 males and 5 females which emerged; also 48 moths, among which are interesting Cossids and Hepialids.

A male specimen of the rare hawkmoth *Trogolegnum pseudambulyx*, Hidalgo, Mexico (9000 ft.), a locality now inaccessible——B. Preston Clark.

An interesting series of 57 butterflies of several groups from the Tolima Range (5000—9000 ft.) and the Muzo district (3500 and 5000 ft.) of Colombia——W. K. Pomeroy. Many of the species are new to the Hope collection and all are very welcome because of the localities and the precision of the data.

More than 1500 European butterflies from the fine collection of the late Rev. H. C. Lang——H. Rowland-Brown. The specimens, which are accompanied by the most excellent data, were captured in the following countries—Switzerland (809), France (180), Spain (120), Corsica (76), Austria (69), Germany (87), Belgium (119), England (60, almost exclusively from Essex). They form a very welcome addition to the European species in the collection.

Two males and 2 females (*bryoniae*) of *Pieris napi* from the eggs laid by a *bryoniae* captured (June, 1911) in Lapland by W. G. Sheldon——Hugh Main, who had reared the insects (Apr., May, 1912) at S. Woodford, N.E.

ADDITIONS TO THE BRITISH COLLECTIONS IN 1914.

Fifty-five butterflies and 506 moths with few exceptions captured or bred in 1914 from larvae found at various localities in the New Forest——F. C. Woodforde. The series includes 29 *Z. meliloti*, 5 *N. chaonia*, 9 *A. ridens*, 15 *Leucania turca*, 5 *Heliothis dipsacea*, 11 *T. variata*. A series of 25 *Taeniocampa gracilis* bred from larvae on Myrica Gale and sallow apparently support the conclusion that the colouring of this species is influenced by the food plant; but further experiments with larger numbers are required. Three *Lycaena aegon* were added to the general collection, and a male *Argynnis paphia*, injured probably by some insectivorous bird, to the bionomic series. Among the specimens outside the New Forest are 2 males and 1 female of the rare moth *Bombyx trifolii*, bred (Aug., 1914) from Bournemouth larvae.

The collection of British Lepidoptera has been further augmented by the following specimens captured or bred from larvae in New Forest localities by the same generous donor:—2 *Oporabia dilutata*, 1 *Eupithecia indigata*, 5 *Thera variata*, 5 *T. obeliscata*, 3 melanic *Boarmia abietaria*, 14 *Sarrothripus undulanus*, 10 *Z. meliloti* (for the general collection); also Hymenoptera Parasitica, many accompanied by their cocoons, from (1) the larva of *Poecilocampa populi*, (2) a Noctuid larva, (3) the larva of *T. variata* or *obeliscata*, (4) a Lepidopterous and (5) a Coleopterous larva.

Ten butterflies and 272 moths, including 5 *Dianthoecia irregularis*, 4 *D. caesia*, and 7 *Polià xanthomista*——E. D. Bostock. This fine series was collected at many localities in Staffordshire (1910—12), N. Wales (1902, 1908), I. of Wight (1890, 1913), also at Folkestone (1893), Arlington, Sussex (1911), Reading (1895), Wicken (1908—11), Hoylake (1894), I. of Man, Rannoch (1884), Aberdeen.

Four bred *Papilio machaon*, 4 *Lycaena corydon* v. *semisyngrapha* (Hertfordsh., 1913), and 291 moths, including 1 *Zygaena achilleae* new to the Hope Collection, 24 *Z. exulans*, 2 *Callimorpha dominula* with yellow instead of the usual red hind wings, 8 *Pachnobia hyperborea*, 12 *Dianthaecia irregularis*, 2 *Nonagria sparganii*, 12 *Gnophos obfuscata*, and 6 melanic *Odontopera bidentata*——B. H. Crabtree. This fine series was collected or bred from localities in Lancashire, I. of Wight (1894, 1908), also at Dorking, Deal (1900), Compton (Berkshire), Tuddenham, Suffolk (1889), Cambridge (1890), Huddersfield (1913), Delamere Forest, Cheshire (1902—1911), Manchester (1904), Seascale, Cumberland (1910), near Lake Windermere (1908, 1910), I. of Lewis (1901), Rannoch (1887, 1890), Braemar (1914).

Two hundred and forty-seven moths, including 7 *Tapi-*

nostola elymi, 1 *Triphaena comes* (*subsequa*), 3 *Agrotis pyrophila*, 13 *A. ashworthii*, 5 *Dasypolia templi*, 3 melanic forms of *O. bidentata*, 41 local forms of *Boarmia repandata* from Worcestershire, Devon, Kent, Cheshire, Lancashire and N. Wales, 20 *Oporabia filigrammaria*, 1 *Macaria liturata* var. *nigrofulvata*, 5 *Acidalia contiguaria*, 1 pink var. of *Hyria auroraria*——C. F. Johnson. This fine series was collected at localities in Kent (1906), the New Forest (1902-11), Devon (1908), Worcestershire (1905-11), Huntingdon (1908), Staffordshire (1903), Shropshire, Derbyshire (1910), Yorkshire (1896), Lancashire (1910-13), Cheshire (1893, 1909), Carnarvonshire (1909-12), Argyll (1905-6), Aberdeen (1892).

One hundred and sixty-four butterflies, including 16 *G. C-album* and 9 *L. sinapis*, and 63 moths, including 3 *Lasiocampa quercifolia*——A. B. Farn. This fine series was collected at localities in Kent (1901), Gloucestershire (1894), Monmouthshire (1913), Herefordshire (1912), Lancashire (1901), Cumberland (1900), Westmoreland, and Carnarvonshire.

Eighty-five butterflies and 78 moths, for the most part captured or bred from larvae taken at localities in Devon ——B. G. Adams. The butterflies include 11 bred *T. betulae*, 13 *Melitaea athalia* (Kent, 1910), 18 *G. C-album* (Wye Valley, 2 bred 1912, 16 captured 1914, of which 4 were added to the general collection). The moths include 28 *Callimorpha dominula*, 6 bred *Psilura monacha* (Wye Valley), 6 *Xanthia flavago* (*silago*), 2 *X. fulvago* (*cerago*) v. *flavescens*, 22 bred *Acronycta tridens*, 8 *Coremia designata* (*propugnata*) and 6 *Eupithecia pusillata* (New Forest).

Ten fine examples of the rare moth *Dianthoecia barrettii*, v. *fickleni* from the Bude district (1914)——H. Bernard Smith.

Fifty-two moths——J. Peed. The following interesting species are included:—10 *Brephos notha*, 6 *Senta maritima*, 18 *Coenobia rufa*, 4 *Toxocampa craccae*, 2 *Stilbia anomala*, 6 *Eupithecia extensaria*. These moths were captured or bred from larvae taken at Cannock Chase (1905), Worcester (1906), Whittlesey (1912), nr. Bude (1906), Hunstanton (1912). The series also includes, from Unst, Shetland (July 23—31) 1 *Charaeas graminis*, 2 *Noctua festiva* v. *conflua*, 1 *Agrotis strigula* (*porphyrea*), 1 *Crymodes exulis*, and 1 *Melanippe montanata*.

Eighty-three moths, including 7 *Lithosia caniola*, 2 *A. ridens*, and 9 *Agrotis obelisca*, from the New Forest (1899) and Torquay (1897)——Rev. G. Hughes.

The following Lepidoptera, etc.——Commander J. J. Walker:—from Sheppey, 6 *Pyrameis cardui* (1899), 13 *Arctia villica* bred (10 in 1913 by donor, 3 in 1908 by H. Brown) from eggs laid by a female from Queenborough, 4 *Eremobia ochroleuca* (1913), 1 *Leucania favicolor* (Captain J. J. Jacobs, 1908); from the Oxford district—6 *P. moneta* (bred 1907), 1 *Oporobia dilutata*, 3 *P. cardui* and 1 *Panorpa* (Cothill), 15 *Galleria melonella* (the 'Honey-comb moth') bred by H. R. Best, Summertown; from Unst, Shetland—2 *Noctua glareosa* var. (J. J. F. X. King, 1895).

Fifteen specimens from one colony of *Zygaena trifolii* on E. Dartmoor (1000 ft.) and 17 from another about 200 yards distant (June)——R. C. L. Perkins. The specimens are of much interest inasmuch as the two series exhibited a difference in average size, in pattern, and, in some individuals of one colony, in colour. Difference had been observed in previous years. Dr. Perkins also presented 18 individuals from a colony of *Parasemia plantaginis* captured June 1 on the bare slope of a hill near Cerne Abbas, Dorset. The 9 females are none of them typical, having less black in the fore wings and hind wings more like those of the male than is usual in this species. These interesting examples of local variation were exhibited to the Ent. Soc., Nov. 4, 1914 (Proc., p. xcv.).

Thirty-nine moths——Joseph Collins. The following interesting species are included:—2 *Cucullia asteris* (bred 1906 from Sheerness larvae), 1 *C. lychnitis* (bred 1909 from Streatley), 2 *P. moneta* (bred 1902 from Kent), 9 *P.*

festucae (bred 1902 from Warrington); also from Lancashire 2 *Agrotis cursoria* (1896), 6 *Hydroecia lucens* (1901), 12 *Carsia paludata* (1903).

An interesting dark var. of *Argynnis selene*, Crowthorne, Berkshire (June, 1913)——Rev. C. F. Thornewill.

An Asilid fly with its prey, a moth, Royston, Herts. (Aug. 3)——E. A. Cockayne.

The moth *Aphomia colonella*, near Stroud (June 28)——H. Eltringham.

The following specimens were captured, unless otherwise stated, in the Oxford district and in the year 1914.

Thirty moths with the pupa-cases of 3 of the specimens——A. H. Hamm. The series includes 13 *Zygaena lonicerae* of which 2 were added to the general collection, and 5 *Toxocampa pastinum*. Mr. Hamm also presented 8 males of the ant *Formicoxenus nitidulus* and 4 males of the fly *Ceratopogon formicarius*, captured on the mound of *Formica rufa* at Bournemouth, Aug. 6 (Proc. Ent. Soc., 1914, p. c.).

Fifteen examples of the Noctuid moth *T. pastinum*, captured in N. Berkshire (July, 1913)——S. Galpin.

A hybernating Peacock butterfly (*Vanessa io*), the Hall staircase, Keble (Feb. 6)——W. J. von M. Pendlebury.

A male of the Poplar hawkmoth (*Smerinthus populi*), on the wall of the University Museum (May 10)——H. Britten, of the Hope Department.

An example of the beetle *Silvanus surinamensis* found (Dec.) in a new and unused drawer of one of the standard cabinets in the Department——the Professor.

THE HOPE LIBRARY: ADDITIONS IN 1913 AND 1914.

Mr. R. S. Bagnall drew up an account of the accessions in 1913 to which those of 1914 have been added by the Professor. Reports or other publications in 1913-14 of the following institutions, &c., have been added to the

Library. All have been presented except those marked * (given by the Professor), † (received in exchange), and ‡ (purchased).

*Academy of Natural Sciences of Philadelphia: Reports.

*Annals of Applied Biology (1914).

American Entomological Society, vols. xx.—xxv. (1893-98) and xxx.—xxxiv. (1904-08). (In part purchased).

Bombay Natural History Society.

Bristol Museum and Art Gallery.

British Museum, Trustees of the:—

Catalogue of the Lepidoptera Phalaenae in the British Museum, vols. xii. and xiii. with supplementary vols. of plates, by Sir George F. Hampson.

A Revision of the Ichneumonidae, pts. II. and III., by Claude Morley.

Guide No. 6, illustrating animal flight.

*Bulletin of Entomological Research.

Cambridge University, Reports of Zoological Department.

†Canada: publications on the subjects of the Hope Dept., issued by the Dept. of Agriculture and especially the Division of Entomology.

†Colombo Museum, Ceylon: Spolia Zeylanica, vols.: Administration Reports.

*Chester Soc. Nat. Sci. Lit. and Art.

†Deutsche Entomologische National-Bibliothek.

†Deutsche Entomologische Zeitschrift.

Dove Marine Laboratory.

Durban Corporation Museum.

Egypt: Report of the Zoological Service.

*Entomological Society of London. Another set, for the Lepidoptera Room, bound uniformly with the rest of the series, presented by G. A. James Rothney.

†Entomologisk Tidskrift, Stockholm.

‡Entomologist.

‡Entomologist's Monthly Magazine.

‡Entomologist's Record.

Études de Lépidoptérologie comparée: the splendidly illustrated volumes for 1913-14. Presented by M. Charles Oberthür.

Federated Malay States Museums.

*Imperial Bureau of Entomology: Reports.

India, Fauna of British:—Hymenoptera, vol. iii., (Ichneumonidae) pt. I., by Claude Morley; Orthoptera (Acridiidae) by W. F. Kirby. Presented by the Secretary of State for India in Council.

Indian Museum, Calcutta: Records, Memoirs (including a monograph on Echinoidea by René Kœhler of Lyon), Reports, and an account of the Institution (1814—1914).

Instituto Oswaldo Cruz, Rio de Janeiro: Memorias.

*Lancashire and Cheshire Entomological Society.

Lancashire Sea-Fisheries Laboratory.

‡Lepidopterorum Catalogus, Wagner, Berlin.

*Linnean Society of London.

Maine, University of: Agric. Exp. Stat., Orono.

Manchester University: Zoological Dept.

Marine Biol. Assoc., W. of Scotland.

*Marine Biol. Assoc., U.K.

Michigan Academy of Science.

*New York Acad. Sci.: Annals.

Novitates Zoologicae: Tring Zool. Museum. Presented by Lord Rothschild, F.R.S.

*Oxford: Transactions (1913) and Proceedings (1914) of the 2nd International Congress of Entomology, August, 1912.

Pennsylvania University: Zoological Laboratory.

Radcliffe Library: Catalogue of Additions.

‡Ray Society.

*Real Sociedad Española de Historia Natural.

*Review of Applied Entomology.

Rhodesia Museum, Bulawayo.

Royal College of Surgeons.

Sarawak Museum.

Scottish Marine Biol. Assoc.

*Société Entomologique de Belgique.

*Société Entomologique de France.

†Société Entomologique Suisse.

*South London Entomological and Natural History Society.

United States: publications on the subjects of the Hope Dept. issued by the Dept. of Agriculture and especially the Bureau of Entomology, including an account of the principal Cactus Insects of the United States, by W. D. Hunter, F. C. Pratt, and J. D. Mitchell; a well illustrated Classification of the Aleyrodidae, by A. L. Quaintance and A. C. Baker; and Bull. No. 91, on the Importation into the U.S. of the parasites of the Gipsy Moth and the Brown-Tail Moth, by L. O. Howard and W. F. Fiske.

United States National Museum, Washington: papers on the subjects of the Hope Dept. by the following authors:—C. P. Alexander (2 papers), L. Bruner (2), Aug. Busck, A. N. Caudell (3), A. H. Clark, T. D. A. Cockerell (5, one with H. L. Viereck), J. C. Crawford (6), A. A. Doolittle, H. G. Dyar (7), H. T. Fernald, J. W. Folsom, A. B. Gahan, A. A. Girault, F. Knab (2), J. R. Malloch (8), A. C. Morgan, P. R. Myers, A. S. Pearse, W. D. Pierce, Mary J. Rathbun (4), Harriet Richardson (2), S. A. Rohwer (5), W. Schaus, H. L. Viereck (6), P. E. Wasmann S. J., H. F. Wickham, C. B. Wilson.

‡Zoological Record.

The following Authors have presented their publications to the Library. Those presented in 1913 are undated, in 1914 dated, in both years undated but with the sign + separating the donations of the two years.

Chr. Aurivillius: 8 papers on Coleoptera.

A. W. Bacot (1914): 5 papers (one in conjunction with Dr. C. J. Martin, F.R.S., and another with W. G. Ridewood).

R. S. Bagnall: 13 papers, chiefly on Thysanoptera and Myriapoda.

Prof. G. S. Brady, F.R.S.: A valuable series of 20 + 2 papers on Crustacea including two monographs in collaboration with Rev. Canon A. M. Norman, F.R.S.

Malcolm Burr, D.Sc. (New College): 5 + 7 papers on Dermaptera (one in conjunction with Dr. K. Jordan).

Dr. G. W. Hale Carpenter: 3 papers including 2 reports on the Bionomics of *Glossina fuscipes* (*palpalis*) of Uganda.

T. L. Casey: Memoirs on the Coleoptera, pts. IV + V.

Filippo Cavazza (1914): Influenza di agenti chimici sullo sviluppo, metamorfosi e riproduzione del *Bombix mori*.

Dr. T. A. Chapman, M.D.: A valuable set of 79 + 17 papers (one in conjunction with G. T. Bethune-Baker).

W. E. Collinge (1914): 5 papers on Isopoda.

Capt. F. W. Cragg, M.D., I.M.S.: 3 pts. (2 to 4) Studies on the Mouth Parts and Sucking Apparatus of the Blood-Sucking Diptera. Also in conjunction with Capt. W. S. Patton, M.B., I.M.S., two memoirs on Indian biting flies.

W. C. Crawley (1914): 8 papers on Ants.

H. St. J. K. Donisthorpe: 6 + 3 papers on Ants and Myrmecophiles (one in conjunction with W. C. Crawley).

H. T. Fernald (1914): 4 papers including 3 Reports from the Mass. Agric. Exp. Stat., Amherst. Also a paper on N. American *Scoliinae*, by O. C. Bartlett.

Katharine Foot and E. C. Strobell (1914): 3 papers on the crossing of the Hemiptera *Euschistus variolarius* and *E. servus*, with a discussion of the bearing of the results upon theories of the chromosomes in relation to heredity.

Prof. G. Gilson (1914): Le Musée d'Histoire Naturelle Moderne, sa Mission, son Organisation, ses droits, Brussels, 1914. A beautifully illustrated monograph.

F. H. Gravely, M.Sc.: 1 + 1, the latter an important monograph on the Oriental *Passalidae*.

Dr. J. L. Hancock: 14 papers chiefly on *Tetriginae* (Orthoptera).

Dr. Anton Handlirsch (1914): 6 papers, chiefly on fossil insects.

Dr. R. Hanitsch (1914): Guide to the Zoological Collections of the Raffles Museum, Singapore.

Glenn W. Herrick: 6 papers on Economic Biology.

J. Douglas Hood: 2 + 9 papers on Thysanoptera.

Dr. B. Daydon Jackson, Ph. D.: Catalogue of the Linnean Specimens of Amphibia, Insecta, aud Testacea noted by Carl von Linné.

Prof. Vernon L. Kellog (1914): A valuable series of 27 papers on ecto-parasites of Vertebrata, especially the Mallophaga parasitic on birds, including 5 written in conjunction with J. H. Paine, 2 with W. M. Mann, and 1 with S. Nakayama, 1 with S. I. Kuwana, 1 with B. L. Chapman, and 1 with the latter and R. E. Snodgrass. In addition to this series 1 paper by the last-named author.

Stefan Kopec: 3 papers (1911-12), including "Untersuchungen über Kastration und Transplantation bei Schmetterlingen." (1911).

Prof. Aug. Lameere: A further part of his "Revision des Prionides".

R. P. Longinos Navás, S.J.: A valuable series of 11 + 16 papers chiefly on Neuroptera and including a Sinopsis of the *Ascalaphidae*.

W. Schaus: 11 papers on Neotropical Lepidoptera. (1912-13).

Prof. W. Morton Wheeler: A valuable set of 16 + 5 papers on Ants (one in conjunction with W. M. Mann).

Original papers, generally published in 1913-14, but a few in 1912 or earlier dates, have also been presented by the following Authors—(papers presented in 1913 and 1914 are separated by +):—E. W. Adair; W. C. Allee; N. Annandale, D.Sc. (2 + 1); E. E. Austen; A. Avinov; F. Balfour-Browne, M.A.; F. J. Ball; F. A. Bather, F.R.S. (1 + 2); Prof. T. Hudson Beare; G. T. Bethune-Baker; Dr. Ignacio Bolivar (2, one with C. Ferrière, B.Sc.); H. H. Brindley, M.A.; P. A. and D. A. J. Buxton; A. E. Cameron; G. H. Carpenter and T. R. Hewitt; A. N.

Caudell; T. D. A. Cockerell (5); Prof. F. J. Cole; W. P. Curtis; Prof. A. Dendy, F.R.S.; Dr. J. Dewitz (2); Dr. A. Dampf (4); L. Doncaster, M.A. (1 + 2, one with J. W. H. Harrison); J. H. Durrant; Dr. Harrison G. Dyar (3); Prof. C. Emery (2); F. M. de la Escallera; Dr. A. Forel; J. C. F. Fryer (2); Dr. R. Gestro; E. E. Green; Sir George Hampson; Dr. Ross G. Harrison (2); Dr. C. Gordon Hewitt (2 + 3); Prof. S. J. Hickson, F.R.S.; W. E. Hoyle and Clara Nördlinger; Rev. J. E. Hull; N. Ikonnikov; Dr. A. D. Imms, D.Sc. (2); Prof. Tokutaro Ito; Charles Janet (2); J. W. Haigh Johnson and H. M. Wilson; Rev. F. W. Johnson; W. J. Kaye; R. Kelly; J. C. Kershaw; G. C. Lamb; Prof. H. Maxwell Lefroy; Dr. G. B. Longstaff; W. S. Marshall; Dr. C. J. Martin, F.R.S.; Dr. C. S. Minot; F. Muir and J. C. Kershaw; Prof. R. Newstead, F.R.S.; A. d'Orchymont (3); W. Dwight Pierce; N. M. Richardson (presented by Mrs. E. R. Bankes); Hugh Scott, M.A. (2 + 3); C. M. Selbie, B.Sc. (2); Capt. R. B. Seymour Sewell, B.A., and B. L. Chaudhuri, B.Sc.; L. Sitowski; Eland Shaw; T. Shiraki (2); K. Simm; Yngve Sjostedt (3); Dr. H. Skinner; Geoffrey Smith and A. H. Hamm: Rev. T. R. R. Stebbing, F.R.S. (1 + 3); G. Storey and Dr. L. H. Gough; C. Strickland, M.A.; C. F. M. Swynnerton; W. M. Tattersall and T. A. Coward; F. H. Taylor (1 + 1); F. V. Theobald; D. G. Tower, B.Sc. (2); Ivar Trägardh; Dr. F. von Tubeuf; Anna Valenti; G. H. Verrall (ed. J. E. Collin); H. Viehmeyer; H. J. Waddington; Dr. Einar Wahlgren; Rev. J. Waterston, B.Sc.; J. H. Watson; F. M. Webster and T. H. Parks; Rev. G. Wheeler.

Important accessions to the Library have been presented by the following donors (in 1913 when no date is given):—

R. S. Bagnall: 39 papers, including a series of 19 by Fr. Meinert (1884-96), a memoir on the Lac Insect by E. P. Stebbing (1910), Biological and Embryological Studies on *Formicidae* by M. C. Tanquary, 4 papers on Chermes by C. Börner (1908-10), and two parts of the "Fauna Hawaiiensis" (1910).

Delegates of the Oxford University Museum (1914): 12 papers on the subjects of the Department, issued by the U.S. National Museum, Washington; also Hymenoptera Aculeata, vol. i., pt. I, by R. C. L. Perkins and Auguste Forel, from "Fauna Hawaiiensis".

M. Hassan, Lincoln College (1914): 54 papers on the subjects of the Department, issued by the U.S. Nat. Mus., Washington.

Dr. G. B. Longstaff, M.A., D.M., New College: A Manual of New Zealand Entomology, by G. V. Hudson; Nature in New Zealand, compiled by J. Drummond and edited by Capt. F. W. Hutton, F.R.S.; A New Zealand Naturalist's Calendar by Geo. M. Thomson (1909); Noch Einmal Mimicry, Selektion Darwinismus, in 2 parts by M. C. Piepers (1903-07); Two papers on Insects Injurious to Cotton in Egypt by F. C. Willcocks (1906-7).

Prof. R. Meldola, F.R.S.: Die Farbenevolution (Phylogenie der Farben) bei den Pieriden (Leiden, 1898) by M. C. Piepers.

Paris, presented by the Minister of Public Instruction: Tome 10, Fasc. 1 (Entomology) of Mesure d'un Arc de Méridien Équatorial en Amérique du Sud, sous le Contrôle Scientifique de l'Académie des Sciences, 1899-1906.

Sir John Rhŷs: Four papers (1909-13) on Lepidoptera, by Count Emilio Turati (one in collaboration with R. Verity).

G. A. James Rothney: A set of 93 + 1 papers, chiefly on Hymenoptera, including valuable desiderata by A. Forel and P. Cameron.

Commander J. J. Walker, Hon. M.A.: A copy of the finely illustrated work "The Butterflies of Hongkong" by J. C. Kershaw.

Col. J. W. Yerbury (1914): 32 papers of various dates —some old and rare—chiefly on Diptera; also 13 volumes of the Entomologist's Monthly Magazine, and many parts of other journals including 9 of F. W. Konow's Zeitschr. f. syst. Hymenopterologie und Dipterologie.

Two hundred and forty-one papers and volumes by various authors were presented by the Professor in 1913. The series includes:

A reprint of Linné's Systema Naturae (Ed. I., 1735).

Academy of Natural Sciences of Philadelphia, Proceedings, Mch. 19-21, 1912, in commemoration of the one hundredth anniversary of the foundation.

A part (vol. xiii., pp. 547-752, Trans. S.A. Phil. Soc., 1908) of Péringuey's Catalogue of South African Coleoptera; also 28 papers on Malacoderms (chiefly *Lycidae*) by J. Bourgeois.

Enzio Reuter's Über die Palpen der Rhopaloceren, Helsingfors, 1896. (This volume was presented to the late Dr. A. R. Wallace, F.R.S., and given by him to Prof. R. Meldola, F.R.S., who in turn handed it to the Professor.)

Dr. Yngve Sjostedt's Übersicht der ergebn. einer Zool. Reise in Kamerun West-Afrika 1890-92: the introduction to his Kilimandjaro-Meru Expedition and two parts on the Kilimandjaro-Meru Orthoptera.

In addition to the purchases already recorded, 21 of the older memoirs on insects published in the Trans. of the Linnean Society were bought in 1913, and The Genitalia of British Geometridae, by F. N. Pierce, in 1914.

E. B. POULTON.

I. A. R. I. 75.

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